

Appendix E1 – Restoration Plans and TMDLs (Watershed Assessments)

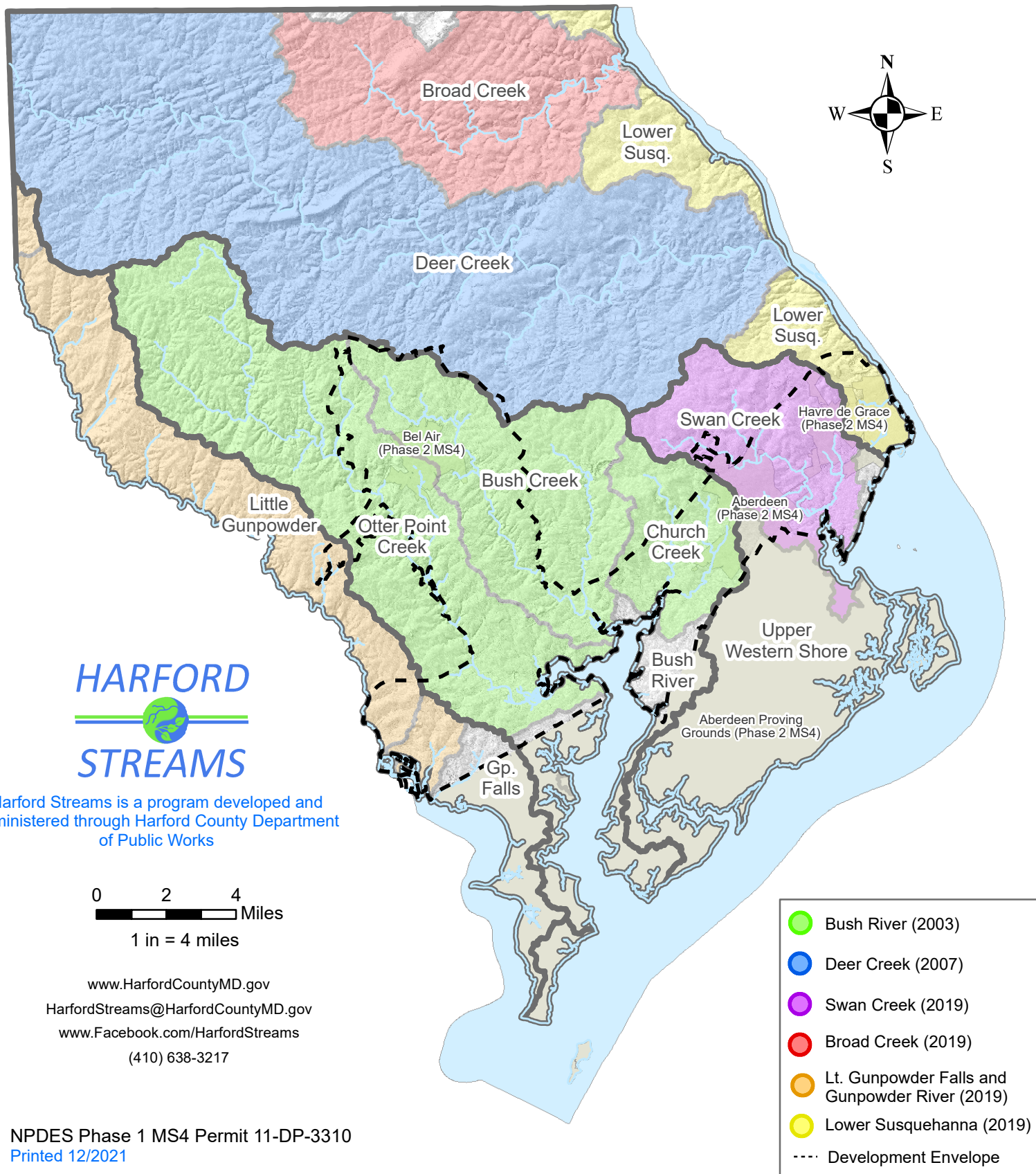
Appendix E1

Harford County, MD Department of Public Works Watershed Protection and Restoration

Large Watershed Assessments Completed through FY2021



Barry Glassman
County Executive



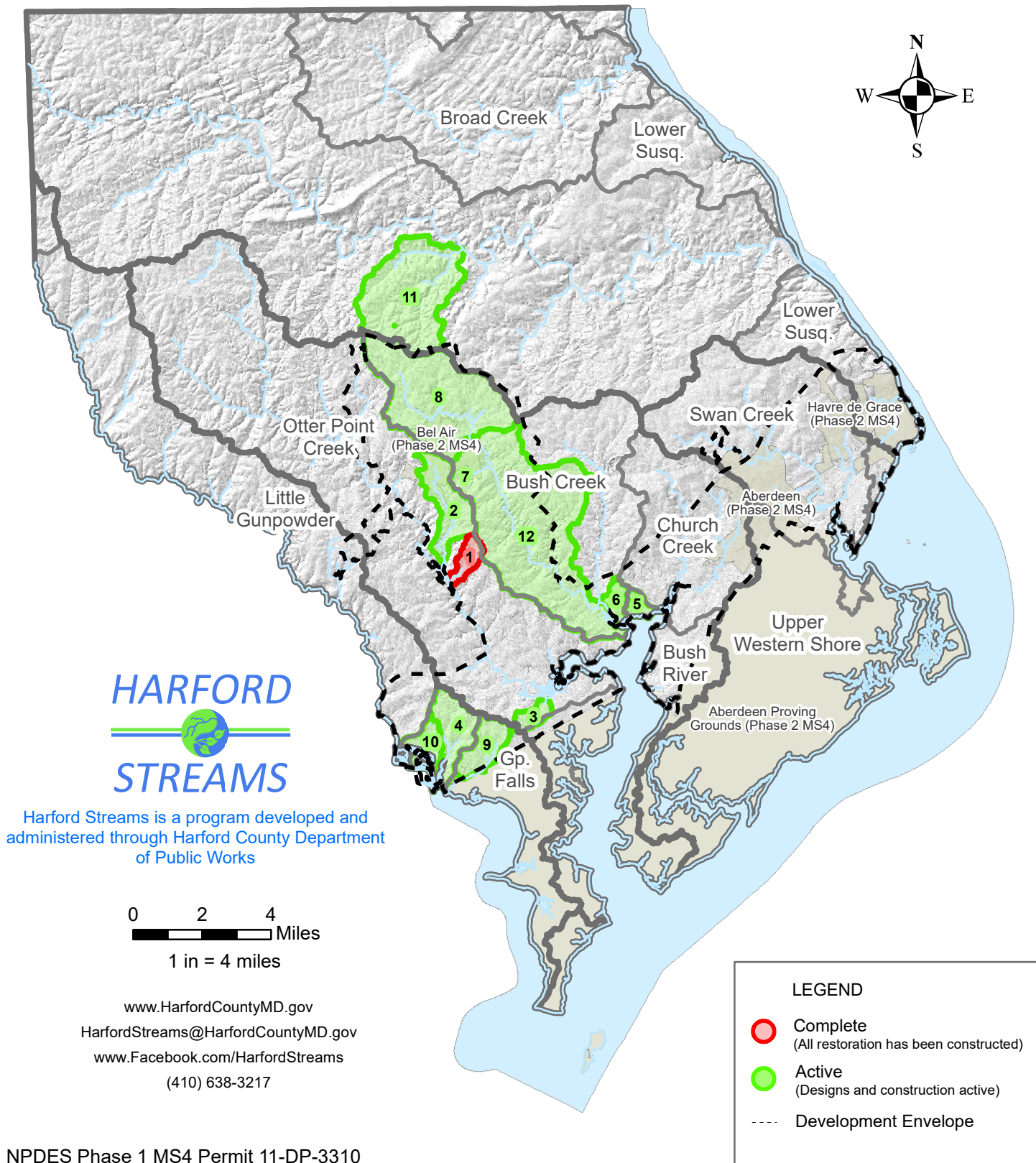
Appendix E1

Harford County, MD Department of Public Works Watershed Protection and Restoration

Small Watershed Assessments Completed through FY2021



Barry Glassman
County Executive



Harford County, MD Department of Public Works
Watershed Protection and Restoration
Small Watershed Assessments



Barry Glassman
County Executive

	Watershed	Completed	Drainage (ac)	Impervious (ac)	
1	Wheel Creek	2008	440	120	27%
2	Plumtree Run	2011	1,650	480	29%
3	Sams Branch	2012	370	90	24%
4	Foster Branch	2012	1,420	250	18%
5	Riverside Area	2014	300	110	37%
6	Declaration Run	2014	430	110	26%
7	Upper Farnandis Branch	2017	490	100	20%
8	Upper Bynum Run	2018	5,350	1,500	28%
9	Upper Emmord Branch	2018	1,010	190	19%
10	Taylors Creek	2018	670	200	30%
11	Stout Bottle Branch	2018	4,670	290	6%
12	Lower Bynum Run	2019	9,260	1,320	14%
Totals			26,060	4,760	18%



Green Choices ... Healthy Streams

Harford Streams is a program developed and administered through Harford County Department of Public Works

Harford County, MD Department of Public Works
Watershed Protection and Restoration



No Small Watershed Assessment

	Project	Year Complete	Number of BMPs	Impervious Credits (ac)	Total Cost	Grants	Cost per Acre
WP000102	Fallston Library SWM Retrofit	Active	1	1.50	\$275,555	\$0	\$183,703
WP000089	Jarrettsville Elementary School Retrofit	Active	1	3.30	\$461,898	\$0	\$139,969
WP000112	Watervale SWM Retrofit	Active	1	0.80	\$227,731	\$0	\$284,664
WP000101	Fallston MS/HS Stream Restoration and SWM Retrofits	Active	3	270.80	\$4,572,603	\$0	\$16,886
WP000106	Fallston Volunteer Firehouse SWM Retrofit	Active	1	2.60	\$213,588	\$0	\$82,149
WP000107	Trib to First Mine Branch Stream Restoration	Active	1	44.00	\$958,677	\$0	\$21,788
WP000014	Heavenly Pond Wetland & Stream Creation	Active	1	31.40	\$1,381,397	\$980,000	\$43,994
WP000100	Watervale Creek Stream Restoration	Active	1	70.00	\$1,477,422	\$0	\$21,106
WP000015	Abingdon Library Bioretention	2010	1	0.60	\$106,644	\$53,322	\$177,740
WP000017	Hickory Elementary School Bioretention	2011	1	0.60	\$179,013	\$0	\$298,354
WP000016	Forest Hill Elementary School Bioretention	2011	1	0.91	\$102,804	\$0	\$112,972
WP000068	Cedarwood Pump Station Demolition	2012	1	0.05			

Harford County, MD Department of Public Works
Watershed Protection and Restoration



WP000048	Heaven Waters Boulton Street Tree Planting	2013	1	0.22	\$7,546	\$7,546	\$34,300
WP000053	Harford Center Tree Planting	2013	1	0.27	\$9,983	\$9,983	\$36,974
WP000049	Churchville Recreation Complex Tree Planting	2013	1	0.32	\$7,434	\$7,434	\$23,231
WP000050	Walters Mill Tree Planting	2013	3	1.03	\$31,099	\$31,099	\$30,193
WP000054	Mt Soma Property Tree Planting	2014	2	1.04	\$28,684	\$28,684	\$27,581
WP000058	North Harford High School Tree Planting	2014	1	0.15	\$3,593	\$3,593	\$23,953
WP000059	Perryman Wellfield Tree Planting	2014	2	1.81	\$43,183	\$43,183	\$23,858
WP000062	Harford Christian School Tree Planting	2014	1	0.50	\$15,972	\$15,972	\$31,944
WP000061	Amoss Mill Road Tree Planting	2014	1	0.18	\$8,448	\$8,448	\$46,933
WP000060	Edwards Lane Tree Planting	2014	2	0.98	\$25,952	\$25,952	\$26,482
WP000052	Edwards Lane Tree Planting II	2015	4	1.71	\$30,772	\$30,772	\$17,995
WP000063	Rider Lane Tree Planting	2015	1	0.63	\$18,302	\$18,302	\$29,051
WP000093	Red Pump Elementary School Tree Planting II	2015	3	0.58	\$17,742	\$17,742	\$30,589
WP000051	Amoss Mill Road Tree Planting II	2015	1	0.21	\$6,291	\$6,291	\$29,958
WP000055	Patterson Mill High School Tree Planting II	2015	1	1.20	\$25,519	\$25,519	\$21,266
WP000031	Norrisville Elementary Bioretention	2015	1	0.63	\$112,600	\$50,000	\$180,160

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WP000073	Hickory Elementary Retrofit	2015	1	0.75	\$82,199	\$0	\$109,598
WP000095	Willoughby Beach Road Tree Planting	2015	1	0.50	\$11,844	\$11,844	\$23,688
WP000096	Trappe Church Road Tree Planting	2015	2	0.28	\$6,802	\$6,802	\$24,294
WP000070	Abingdon Library Water Quality Improvements	2017	3	3.70	\$215,891	\$0	\$58,349
WP000046	Leight Center Parking Lot Green Infrastructure	2017	3	0.41	\$277,450	\$125,000	\$676,706
WP000074	Bear Cabin Branch Wetland and Stream Restoration	2018	1	110.25	\$1,090,000	\$775,000	\$9,887
WP000086	Annie's Playground Stream Restoration	2019	2	98.88	\$700,865	\$350,000	\$7,088
				Totals	652.78	\$12,735,503	\$2,632,488
							\$19,509

Wheel Creek Watershed Assessment (2008)

(440 acres / 120 acres impervious)

	Project	Year Complete	Number of BMPs	Impervious Credits (ac)	Total Cost	Grants	Cost per Acre
WP000030	Wheel Creek at Calvert Walks Stream Restoration	2013	1	21.75	\$324,682	\$204,951	\$14,928
WP000022	Wheel Creek at Gardens of Bel Air SWM Retrofit	2013	1	4.79	\$322,120	\$178,804	\$67,248
WP000026	Wheel Creek at Festival at Bel Air SWM Retrofit	2016	1	12.00	\$385,601	\$195,436	\$32,133
WP000024	Wheel Creek at Country Walk 1A SWM Retrofit	2016	2	8.66	\$576,532	\$324,119	\$66,574

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WP000025	Wheel Creek at Country Walk 1B SWM Retrofit	2017	1	3.66	\$292,152	\$118,614	\$79,823
WP000027	Lower Wheel Creek SWM Retrofit & Stream Restoration	2017	6	139.52	\$2,103,964	\$1,420,177	\$15,080
				Totals	190.38	\$4,005,051	\$2,442,103
						\$21,037	

Plumtree Run Watershed Assessment (2011)

(1650 acres / 480 acres impervious)

	Project	Year Complete	Number of BMPs	Impervious Credits (ac)	Total Cost	Grants	Cost per Acre
WP000040	Pumphrey Property Demolition	2009	3	0.51			
WP000013	Plumtree Run at Tollgate Stream Restoration	2011	1	50.40	\$428,877	\$215,000	\$8,509
WP000035	Ring Factory ES SWM Retrofit & Stream Restoration	2018	3	41.33	\$1,490,585	\$660,132	\$36,065
WP000088	Stormwater Retrofit at Homestead Elementary	2019	1	1.57	\$131,374	\$0	\$83,678
WP000087	Tributary to Plumtree Run at Wakefield Manor Stream Restor	2019	1	8.58	\$97,159	\$0	\$11,324
WP000039	Plumtree Run at Barrington Stream Restoration	2020	7	92.78	\$3,287,052	\$0	\$35,428
WP000104	Courthouse Bioretention	2020	1	0.48	\$168,060	\$0	\$350,126
				Totals	195.65	\$5,603,108	\$875,132
							\$28,638

Harford County, MD Department of Public Works
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Foster Branch Watershed Assessment (2012)

(1420 acres / 250 acres impervious)

Project	Year Complete	Number of BMPs	Impervious Credits (ac)	Total Cost	Grants	Cost per Acre
WP000037 Stillmeadow Stream Restoration	Active	2	36.70	\$945,206	\$0	\$25,755
WP000042 Washington Court Demolition	2011	1	2.11			
WP000019 Woodbridge SWM Retrofit	2013	1	3.80	\$256,467	\$0	\$67,491
WP000032 Foster Branch at Trimble Road Stream Restoration	2014	1	24.26	\$570,051	\$275,000	\$23,498
WP000020 Woodbridge Stream Restoration	2015	1	24.60	\$553,083	\$258,832	\$22,483
WP000036 Foster Branch at Dembytown Stream Restoration	2017	2	42.10	\$902,662	\$500,000	\$21,441
WP000033 Willoughby Beach SWM Retrofit & Stream Restoration	2020	6	163.57	\$1,819,227	\$1,100,000	\$11,122
Totals			297.14	\$5,046,696	\$2,133,832	\$16,984

Harford County, MD Department of Public Works
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Declaration Run Watershed Assessment (2014)

(430 acres / 110 acres impervious)

Project	Year Complete	Number of BMPs	Impervious Credits (ac)	Total Cost	Grants	Cost per Acre
WP000043 Northwest Branch Declaration Run Stream Restoration	Active	2	69.40	\$3,096,427	\$0	\$44,617
WP000034 Church Creek ES SWM Retrofit & Stream Restoration	Active	3	47.70	\$2,023,804	\$0	\$42,428
Totals			117.10	\$5,120,232	\$0	\$43,725

Upper Farnandis Branch Watershed Assessment (2017)

(490 acres / 100 acres impervious)

Project	Year Complete	Number of BMPs	Impervious Credits (ac)	Total Cost	Grants	Cost per Acre
WP000097 Woodland Run Stream Restoration	Active	1	33.60	\$1,305,196	\$0	\$38,845
WP000021 Sunnyview Drive Stream Restoration	Active	1	95.10	\$2,312,549	\$0	\$24,317
Totals			128.70	\$3,617,745	\$0	\$28,110

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Watershed Protection and Restoration



Upper Bynum Run Watershed Assessment (2018)

(5350 acres / 1500 acres impervious)

Project		Year Complete	Number of BMPs	Impervious Credits (ac)	Total Cost	Grants	Cost per Acre
WP000091	C Milton Wright Stormwater Retrofit and Stream Restoration	Active	1	75.20	\$1,854,807	\$0	\$24,665
WP000109	Hickory Vet Retrofit	Active	1	1.50	\$325,949	\$0	\$217,299
WP000108	Gavigans Retrofit	Active	1	1.70	\$334,174	\$0	\$196,573
WP000110	Spenceola Retrofit	Active	1	7.30	\$473,388	\$0	\$64,848
WP000012	Bynum Ridge Stream Stabilization	2011	1	13.95	\$225,212	\$0	\$16,144
WP000018	Friends Pond SWM Retrofit	2011	1	11.70	\$109,761	\$0	\$9,381
WP000056	Magnolia Middle School Tree Planting	2014	1	0.23	\$5,295	\$5,295	\$23,022
WP000094	Magnolia Middle School Tree Planting II	2015	2	0.47	\$12,267	\$12,267	\$26,101
WP000105	Mariner Point Tree Planting	2020	1	0.28	\$78,899	\$0	\$281,783
WP000085	Emmord Stream Restoration	2020	1	58.50	\$749,451	\$0	\$12,811
Totals				170.83	\$4,169,203	\$17,562	\$24,406

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Lower Bynum Run Watershed Assessment (2019)

(9260 acres / 1320 acres impervious)

Project	Year Complete	Number of BMPs	Impervious Credits (ac)	Total Cost	Grants	Cost per Acre
WP000057 Patterson Mill High School Tree Planting	2013	1	0.80	\$23,688	\$23,688	\$29,610
WP000029 Bynum at St Andrews Way Stream Restoration	2019	1	92.52	\$2,095,854	\$1,600,000	\$22,653
Totals			93.32	\$2,119,542	\$1,623,688	\$22,713
Totals			1845.90	\$42,417,080	\$9,724,805	\$22,979



Green Choices ... Healthy Streams

Harford Streams is a program developed and administered through Harford County Department of Public Works

PROJECT SELECTION: BMP PRIORITY MATRIX

Presented by RK&K



PURPOSE

- Develop a weighted ranking system for all viable proposed BMPs identified in Harford County Watershed Assessments (WSAs)
 - Present Cecil County Case Study
- Use the ranking system in order to choose the next round of MS4 projects

EXAMPLE MATRIX

Maximum	Ranking Category	Weight	Ranking				
			1	2	3	4	5
15	Credit Type at BMP Site	3	Retrofit of Existing Facility at site that has Full Treatment; but Facility is not Maximized	New Facility at Site with Partial Existing IA Treatment	Retrofit of Existing Facility at Site with Partial Existing IA Treatment	New Facility with No Existing WQ Treatment	Retrofit with No Existing WQ Treatment
30	BMP Type	6	Other Small or Alternative Practices (street sweeping, etc.)	Swales (Dry, Wet, Bio); Tree Planting	Filtering Ibioretention, microbioretention, rain gardens, sand filters)	Stream Restoration or Shoreline Stabilization	Ponds and Wetlands
75	IA Credit Potential	15	0.1-0.3 acres of credit	0.3-0.5 acres of credit	0.5-1 acres of credit	1-3 acres of credit	3+ acres of credit
25	BMP Ownership	5	Federal/State Owned	Multiple Owners	Privately Owned	Town Owned (Without their Own MS4)	County Owned
60	Cost per IA Acre Treated	12	\$70,000-\$75,000	\$61,000- \$69,000	\$50,000-\$60,000	\$36,000-\$49,000	\$26000- \$35,000
25	Utilities	5	Commercial or Industrial Land Use	High Density Residential or Institutional	Medium Density Residential	Low Density Residential	Agriculture, Cropland, Forest, Open Space, Large lot Subdivisions
30	Natural Resource Impacts for Permitting	6	4+ impacts	3 impacts	2 impacts	1 impact	No Impacts
25	Community Support	5	Residential	Institutional	Forest	Cropland, Agriculture, Large Lot Subdivision	Commercial, Industrial
10	Number of Proposed BMPs on Site	2	1	2	3	4	5+
5	Feasibility Study	1	1				5
300	Total	60					

CATEGORY #1: CREDIT TYPE AT BMP SITE

1

Retrofit of existing facility at site that has full treatment but is not fully maximized

2

New facility at site with partial existing IA treatment

3

Retrofit of existing facility at site with partial existing IA treatment

4

New facility with no existing WQ treatment

5

Retrofit with no existing WQ treatment

Weight = 3

Maximum points = 15

CATEGORY #2: BMP TYPE

1

Other small or
alternative
practices (street
sweeping, etc.)

2

Swales (dry,
wet, bio), tree
planting

3

Filtering
(bioretention,
microbioretentions,
rain garden, sand
filter, etc.)

4

Stream
Restoration or
Shore
Stabilization

5

Ponds and
Wetlands

Weight = 6

Maximum points = 30

CATEGORY #3: IA CREDIT POTENTIAL

1	2	3	4	5
0.1 – 0.3 acres of credit	0.3 – 0.5 acres of credit	0.5 – 1 acres of credit	1 – 3 acres of credit	3+ acres of credit

Weight = 15

Maximum points = 75

CATEGORY #4: BMP OWNERSHIP

1	2	3	4	5
Federal/State Owned	Multiple Owners	Privately Owned	Town Owned (outside their own MS4)	County Owned

Weight = 5

Maximum points = 25

CATEGORY #5: COST PER IA ACRE TREATED

1	2	3	4	5
\$70,000- \$75,000	\$61,000- \$69,000	\$50,000- \$60,000	\$36,000- \$49,000	\$26,000- \$35,000

Weight = 12

Maximum points = 60

CATEGORY #6: UTILITIES

1

Commercial
or Industrial
Land Use

2

High Density
Residential or
Institutional

3

Medium Density
Residential

4

Low Density
Residential

5

Agriculture,
Cropland,
Forest, Open
Space, Large
Lot Subdivisions

Weight = 5

Maximum points = 25

CATEGORY #7: NATURAL RESOURCE IMPACTS FOR PERMITTING

1	2	3	4	5
4+ Impacts	3 Impacts	2 Impacts	1 Impact	No Impacts

Weight = 6

Maximum points = 30

CATEGORY #8: COMMUNITY SUPPORT

1	2	3	4	5
Residential	Institutional	Forest	Cropland, Agriculture, Large Lot Subdivision	Commercial, Industrial

Weight = 5

Maximum points = 25

CATEGORY #9: NUMBER OF PROPOSED BMPS ON SITE

1	2	3	4	5
1	2	3	4	5+

Weight = 2

Maximum points = 10

CATEGORY #10: FEASIBILITY STUDY

1

No

5

Yes

Weight = 1

Maximum points = 5

EXAMPLE MATRIX

Maximum	Ranking Category	Weight	Ranking				
			1	2	3	4	5
15	Credit Type at BMP Site	3	Retrofit of Existing Facility at site that has Full Treatment; but Facility is not Maximized	New Facility at Site with Partial Existing IA Treatment	Retrofit of Existing Facility at Site with Partial Existing IA Treatment	New Facility with No Existing WQ Treatment	Retrofit with No Existing WQ Treatment
30	BMP Type	6	Other Small or Alternative Practices (street sweeping, etc.)	Swales (Dry, Wet, Bio); Tree Planting	Filtering Ibioretention, microbioretention, rain gardens, sand filters)	Stream Restoration or Shoreline Stabilization	Ponds and Wetlands
75	IA Credit Potential	15	0.1-0.3 acres of credit	0.3-0.5 acres of credit	0.5-1 acres of credit	1-3 acres of credit	3+ acres of credit
25	BMP Ownership	5	Federal/State Owned	Multiple Owners	Privately Owned	Town Owned (Without their Own MS4)	County Owned
60	Cost per IA Acre Treated	12	\$70,000-\$75,000	\$61,000- \$69,000	\$50,000-\$60,000	\$36,000-\$49,000	\$26000- \$35,000
25	Utilities	5	Commercial or Industrial Land Use	High Density Residential or Institutional	Medium Density Residential	Low Density Residential	Agriculture, Cropland, Forest, Open Space, Large lot Subdivisions
30	Natural Resource Impacts for Permitting	6	4+ impacts	3 impacts	2 impacts	1 impact	No Impacts
25	Community Support	5	Residential	Institutional	Forest	Cropland, Agriculture, Large Lot Subdivision	Commercial, Industrial
10	Number of Proposed BMPs on Site	2	1	2	3	4	5+
5	Feasibility Study	1	1				5
300	Total	60					

METHODOLOGY

1. Collect all necessary GIS layers including property owner, land use/zoning, natural resources.

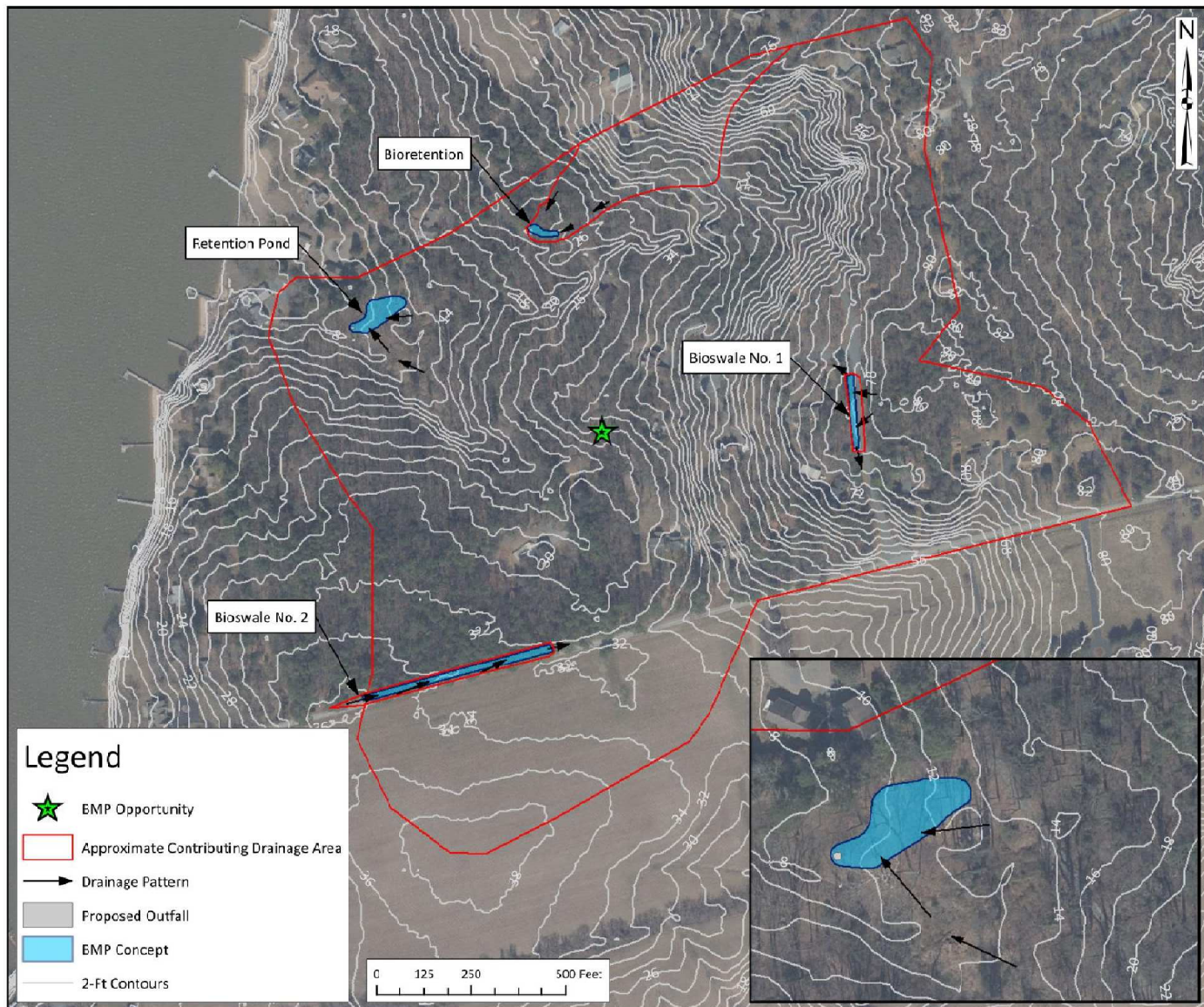
2. Determine the rank for each BMP in each of the 10 categories and multiply the rank by the weight.

3. For each BMP, sum the resulting values obtained by multiplying the rank by the weight for each of the 10 categories. This is the BMP's score.

4. Order the BMP scores from greatest to least to find the priority ranking order.

EXAMPLE FACILITY:

Maximum	Ranking Category	Weight	Ranking					Wet Pond Ex
			1	2	3	4	5	
15	Credit Type at BMP Site	3	Retrofit of Existing Facility at site that has Full Treatment but Facility is not Maximized	New Facility at Site with Partial Existing IA Treatment	Retrofit of Existing Facility at Site with Partial Existing IA Treatment	New Facility with No Existing WQ Treatment	Retrofit with No Existing WQ Treatment	12
30	BMP Type	6	Other Small or Alternative Practices (street sweeping, etc.)	Swales (Dry, Wet, Bio); Tree Planting	Filtering (bioretention, microbioretention, rain gardens, sand filters)	Stream Restoration or Shoreline Stabilization	Ponds and Wetlands	30
75	IA Credit Potential	15	0.1-0.3 acres of credit	0.3-0.5 acres of credit	0.5-1 acres of credit	1-3 acres of credit	3+ acres of credit	75
25	BMP Ownership	5	Federal/State Owned	Multiple Owners	Privately Owned	Town Owned (Without their Own MS4)	County Owned	15
60	Cost per IA Acre Treated	12	\$70,000-\$75,000	\$61,000- \$69,000	\$50,000-\$60,000	\$36,000-\$49,000	\$26000- \$35,000	60
25	Utilities	5	Commercial or Industrial Land Use	High Density Residential or Institutional	Medium Density Residential	Low Density Residential	Agriculture, Cropland, Forest, Open Space, Large lot Subdivisions	15
30	Natural Resource Impacts for Permitting	6	4+ impacts	3 impacts	2 impacts	1 impact	No Impacts	24
25	Community Support	5	Residential	Institutional	Forest	Cropland, Agriculture, Large Lot Subdivision	Commercial, Industrial	5
10	Number of Proposed BMPs on Site	2	1	2	3	4	5+	8
5	Feasibility Study	1	1				5	5
300	Total	60						Total = 249



**Remillard Property
Pond Retrofit, Bioretention,
Bioswale(s)**

**Back Creek, Bohemia River, Lower
Elk River Watershed Assessment
Cecil County, Maryland
June 2021**

The regional map shows the location of the project area within Cecil County, Maryland. It highlights the Back Creek, Bohemia River, and Lower Elk River watersheds. The project area is marked with a green star and labeled "Restoration Opportunities".

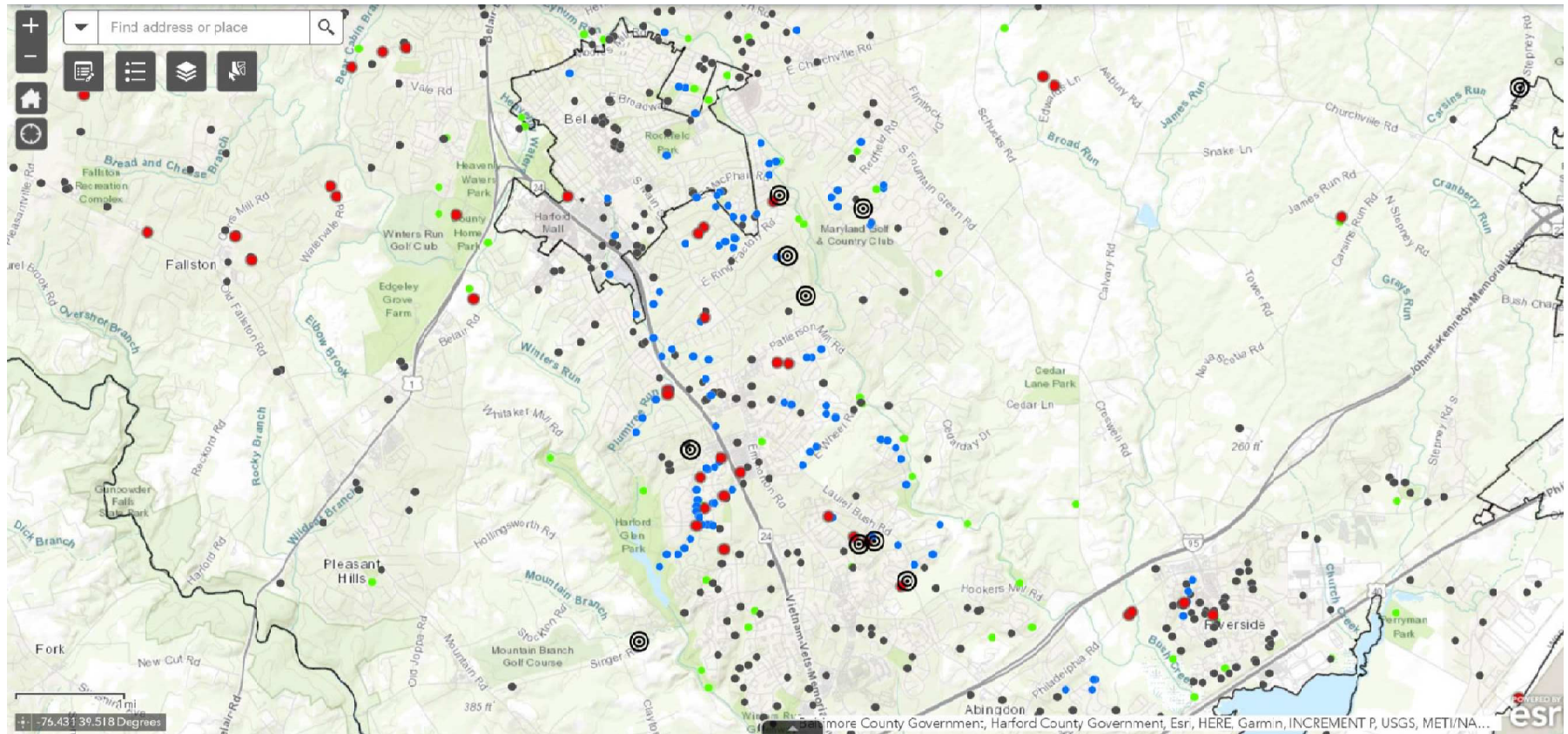
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CECIL COUNTY

EXAMPLE: CECIL COUNTY TOP 10 PROJECTS

Site Location Names	Credit Type at BMP Site	Credit Type at BMP Site	BMP Type	BMP Type	IA Potential	IA Potential	BMP Ownership	BMP Ownership	Cost per IA Acre	Cost per IA Acre	Utilities	Utilities	Natural Resource Impacts	Natural Resource Impacts	Community Support	Community Support	Number of Proposed BMPs	Number of Proposed BMPs	Feasibility	Feasibility	Score	Priority
Remillard Wet Pond	New Facility with No Existing WQ Treatment	12	Wet Pond	30	3.37	75	Remillard	15	\$ 25,115.00	60	Med Residential	15	1	24	Residential	5	4	8	Yes	5	249	1
676 Court House Point Rd	New Facility with No Existing WQ Treatment	12	Stream Restoration	24	3+	75	McLeer Lauren D	15	\$ 64,500.00	24	Forest	25	2	18	Forest	15	1	2	Yes	5	215	2
Chesapeake City Little League Park	New Facility with No Existing WQ Treatment	12	Bioswale	12	0.31	30	Town	20	\$ 44,000.00	48	Open space	25	None	30	Large Lot	20	1	2	Yes	5	204	3
240 Bohemia Church Rd	New Facility with No Existing WQ Treatment	12	Stream Restoration	24	3+	75	Sentman John C	15	\$ 64,500.00	24	Forest	25	4	6	Forest	15	1	2	Yes	5	203	4
Stemmer's Run Boat Ramp Retrofit	Retrofit with No Existing WQ Treatment	15	(Dry Pond Retrofit) Bioretention, Sand Filter, Submerged Gravel Wetland	18	1.62	60	CECO	25	\$ 72,500.00	12	Forest	25	2	18	Forest	15	2	4	Yes	5	197	5
Rogues Harbor	New Facility with No Existing WQ Treatment	12	Submerged Gravel Wetland	18	2.64	60	State	5	\$ 49,875.00	36	Large Lot	25	3	12	Large Lot	20	1	2	Yes	5	195	6
Harts M E Church	New Facility with No Existing WQ Treatment	12	Bioretention	18	0.62	45	Trustees of Harts ME Church	15	\$ 49,875.00	36	Institutional	10	None	30	Institutional	10	1	2	Yes	5	183	7
Cecilton Park	Retrofit with No Existing WQ Treatment	15	(Dry Pond Retrofit) Bioretention, Sand Filter, Submerged Gravel Wetland	18	0.36	30	CECO	25	\$ 72,500.00	12	Open space	25	None	30	Large Lot	20	1	2	Yes	5	182	8
Cecil County Animal Services	New Facility with No Existing WQ Treatment	12	Bioswale	12	0.22	15	County	25	\$ 44,000.00	48	Commercial	5	None	30	Commercial	25	1	2	Yes	5	179	9
Remillard Bioretention	New Facility with No Existing WQ Treatment	12	Bioretention	18	0.41	30	Remillard	15	\$ 49,875.00	36	Med Residential	15	None	30	Residential	5	4	8	Yes	5	174	10

NEXT STEPS...





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MEMORANDUM

Date: August 12, 2021

To: Christine Buckley – Harford County Department of Public Works

From: Kate Gordon – RK&K

CC: Danielle Hankins – RK&K

Re: Harford County Parcel Assessment & Potential Land Cover Conversion BMP EIA Credit

EXECUTIVE SUMMARY

RK&K environmental scientists conducted a review of County owned properties to identify opportunities for establishment of creditable land cover conversion BMPs to meet the requirements of Harford County's National Pollution Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit. The BMPs identified include forest planting, conservation landscaping (meadow creation), riparian forest planting, riparian conservation landscaping, and urban tree canopy. RK&K assessed 214 County owned parcels to identify the sites with the highest potential for MS4 impervious acre restoration credit.

RK&K categorized the 214 County owned parcels based on BMP potential and developed a geodatabase of potential BMP locations for the parcels with the most potential. Based on this analysis, the top Parks and Recreation parcels and the top Harford County Public School (HCPS) parcels with the most impervious credit potential were identified. RK&K also evaluated the low mow site plans provided by HCPS and noted the current status of each site based on a desktop review. In addition to the 214 County owned parcels evaluated, RK&K summarized the potential credit from the Grove and existing Alliance for Chesapeake Bay plantings. A total of 251.25 acres of planting opportunities were identified that could generate 169.54 impervious acre restoration credits to meet the County's MS4 requirements.

INTRODUCTION

Harford County is developing a Land Cover Conversion Program to implement tree, forest, and meadow planting BMPs throughout the county to help meet the requirements of the National Pollution Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit. MS4 jurisdictions are required to implement restoration activities to treat 30% of untreated impervious surfaces and alternative BMPs, including land cover conversion BMPs, can be used to meet these requirements based on the "Equivalent Impervious Acre" (EIA) conversion factor for each BMP. RK&K reviewed the County Parcel Assessment completed by URS in 2012, including 214 county owned parcels, to identify potential sites for planting.

METHODS

RK&K conducted a GIS desktop review to identify potential locations for land cover conversion BMPs. The definitions and Equivalent Impervious Acre conversion factors (EIA_f) for the land cover conversion BMPs summarized in Table 1 are based on the *2020 Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated* Guidance developed by Maryland Department of the Environment (MDE). To calculate the Equivalent Impervious Acre (EIA) restoration credit, the acreage of each BMP is multiplied by the EIA_f .

Table 1. Land Cover Conversion BMP Definitions and Equivalent Impervious Acre (EIA_f) Factor

BMP Type	Definitions/Requirements
Forest Planting ($EIA_f = 1.10$)	The conversion of pervious turf to a forested land cover. Forest planting credit is available for planting occurring on one contiguous acre or greater. Planting should have a survival rate of 100 trees planted on one acre. At least 50% of trees should have a two-inch diameter or greater or a 1-inch caliper at time of planting.
Conservation Landscaping (Meadow Planting) ($EIA_f = 0.37$)	The conversion pervious turf to an unmanaged (unfertilized, unmowed) meadow. Conservation landscaping refers to areas of managed turf that are converted into perennial meadows using species that are native to the Chesapeake Bay region.
Riparian Forest Planting ($EIA_f = 1.50$)	The conversion of pervious turf to a forested land cover occurring within 100 feet of a perennial stream. The recommended buffer width is 100 feet, with a 35-foot minimum width required. Riparian forest planting credit is available for planting occurring on one contiguous acre or greater. Planting should have a survival rate of 100 trees planted on one acre.
Riparian Conservation Landscaping (Riparian Meadow Planting) ($EIA_f = 0.50$)	The conversion of pervious turf to an unmanaged meadow within 100 feet of a perennial stream. Planted or seeded species have to be native to the Chesapeake Bay region.

BMP Type	Definitions/Requirements
Urban Tree Canopy ($EIA_f = 0.28$)	The conversion of pervious turf to tree canopy over turf. The urban tree canopy BMP is applicable where the resulting understory remains managed (regularly mowed and/or fertilized). One tree planted is equivalent of 0.01 acre of implementation. Credit for urban tree planting assumes a survival rate of 100%. This BMP does not require trees to be planted in a contiguous area.

The initial assessment included reviewing the 214 county owned parcels included in the County owned parcel review conducted by URS in 2012 to determine potential (low, medium, high) for land cover conversion BMPs and to provide overall recommendations based on existing conditions. Existing conditions that were taken into consideration included locations of streams, DNR wetlands, NWI wetlands, FEMA 100-year floodplain, Stream Challenge Grant sites, stormwater BMP sites, and Forest Conservation Areas. Following the initial assessment, RK&K used aerial photographs, Google StreetView, NearMap imagery and Chesapeake Conservancy's high resolution land cover data to narrow down the 214 properties to 38 properties with the highest credit potential based on parcel size and available open space. Open areas clearly being used for recreation (e.g., ballfields) were excluded from consideration and BMPs proposed in active crop fields are limited. Potential land cover conversion BMP locations were created in an ArcGIS geodatabase for each of the 38 properties and the EIA credit was calculated for each potential BMP. The total EIA credit was calculated for each parcel to identify the top Parks and Recreation parcels and top HCPS parcels with the highest potential for EIA credit associated with implementation of land cover conversion BMPs.

RK&K developed MEP estimates for the next permit term based on the assumption that about 50% of the potential BMPs identified could move forward.

Low Mow Sites

RK&K compared the site plans showing locations of existing low mow sites provided by HCPS to existing aerial imagery on GIS to determine whether the sites are still maintained as low mow sites and could be credited as a conservation landscaping BMP.

Alliance for the Chesapeake Bay Plantings

The Alliance for the Chesapeake Bay provided a summary of existing planting sites and acreage. RK&K determined the BMP category for each site based on acreage (i.e., forest planting for sites > 1 acre and urban tree canopy for sites < 1 acre) and calculated the total impervious restoration credit provided by these sites. The EIA credit for the urban tree canopy sites was calculated using the EIA_f from MDE's *2014 Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated* Guidance document for urban tree canopy BMP ($EIA_f = 0.38$).

RESULTS

The potential additional EIA restoration credit available based on evaluation of Harford County owned parcels as well as the existing sites planted by the Alliance for the Chesapeake Bay totals 169.54 EIA

credit from planting 251.25 acres. Total EIA by BMP type and location are summarized in Table 2. Total potential EIA credit identified on Harford County property is 169.54, with 102.96 credit acres recommended as priority planting sites to pursue during this permit term on County Owned Property. The MEP estimates developed on 7/2/21 are also summarized in Table 2. The MEP estimates were based on the understanding that many of the proposed sites would not be practicable to move forward with based on feedback from the landowners and other County priorities.

Table 2. Summary of Land Cover Conversion EIA Credit by BMP and Location

BMP	Recommended						Future Consideration		Existing		Potential EIA Credit	7/2/21 MEP Estimate - EIA Credit
	Top Parks & Rec Parcels		Top HCPS Parcels		The Grove		Additional Opportunities on County Parcels		Alliance for the Chesapeake Bay Sites			
	Planting Acres	EIA Credit Acres	Planting Acres	EIA Credit Acres	Planting Acres	EIA Credit Acres	Planting Acres	EIA Credit Acres	Planting Acres	EIA Credit Acres		
Conservation Landscaping	45.06	16.67	22.02	8.15	3.00	1.11	20.28	7.50	0.00	0.00	33.43	18.50
Riparian Conservation Landscaping	0.46	0.23	0.00	0.00	0.00	0.00	3.19	1.60	0.00	0.00	1.83	1.00
Urban Tree Canopy	9.96	2.79	19.85	5.56	1.79	0.50	18.25	5.11	3.70	1.41	15.37	8.40
Forest Planting	41.36	45.50	4.12	4.53	1.78	1.95	10.99	12.09	33.30	36.63	100.70	33.00
Riparian Forest Planting	10.65	15.97	0.00	0.00	0.00	0.00	1.49	2.24	0.00	0.00	18.21	12.00
Totals	107.49	81.16	45.99	18.24	6.57	3.56	54.20	28.54	37.00	38.04	169.54	71.90

Top 10 Parks & Recreation Parcels

The Parks and Recreation parcels with the highest potential for land cover conversion BMPs include Deer Creek Conservation Area Sandy Hook, Schucks Road Regional Sports Complex, Harford County Landfill, Churchville Recreation Complex, Edgeley Grove Farm, Edgewater Village Park, Perryman Park, Cedar Lane Park Regional Field Sports Complex, Heavenly Waters Park, and Prospect Mill Park.

The BMP opportunities identified at these park properties total of 107.49 acres of planting for 81.16 impervious restoration credits. Mapping for each parcel can be found in **Attachment A**.

Top HCPS Parcels

The HCPS parcels with the highest potential for land cover conversion BMPs include Magnolia Elementary and Middle School, North Harford Elementary School and Middle School and High School, Edgewood Elementary School, Roye-Williams Elementary School, Aberdeen Middle School, Hickory Elementary School, Prospect Mill Elementary School (John Archer Special Ed and Harford Technical High School), Red Pump Elementary School, and Joppatowne High School. The BMP opportunities identified at these 9 schools total 45.99 acres of planting for 18.24 impervious restoration credits. Mapping for each parcel can be found in **Attachment B**.

The Grove

Land cover conversion BMPs at the Grove were previously identified by RK&K and coordination with Parks and Recreation and the Division of Facilities and Operation has already occurred. The Grove parcel is located at the intersection of US 1 (Conowingo Road) and MD 136 (Priestford Road) (**Attachment C**). The BMP opportunities identified at the Grove total 6.57 acres of planting for 3.56 impervious restoration credits.

Low Mow Sites

Harford County provided site plans for 13 HCPS parcels with low mow areas. Of the 13 HCPS parcels, five still have actively maintained low mow areas (Edgewood Middle School and High School, Fountain Green Elementary School, Havre De Grace Middle School and High School, John Archer School – Prospect Elementary and Harford Tech School, and Red Pump Elementary School). The low mow sites previously designated at the other 8 schools are either completely forested, frequently being mowed, or previously planted as a Stream Challenge Grant Site. The existing low mow sites will be evaluated to determine potential as a conservation landscaping BMP and maintenance needs, including supplemental seeding with native species. A markup of the plans provided by HCPS is provided in **Attachment D**.

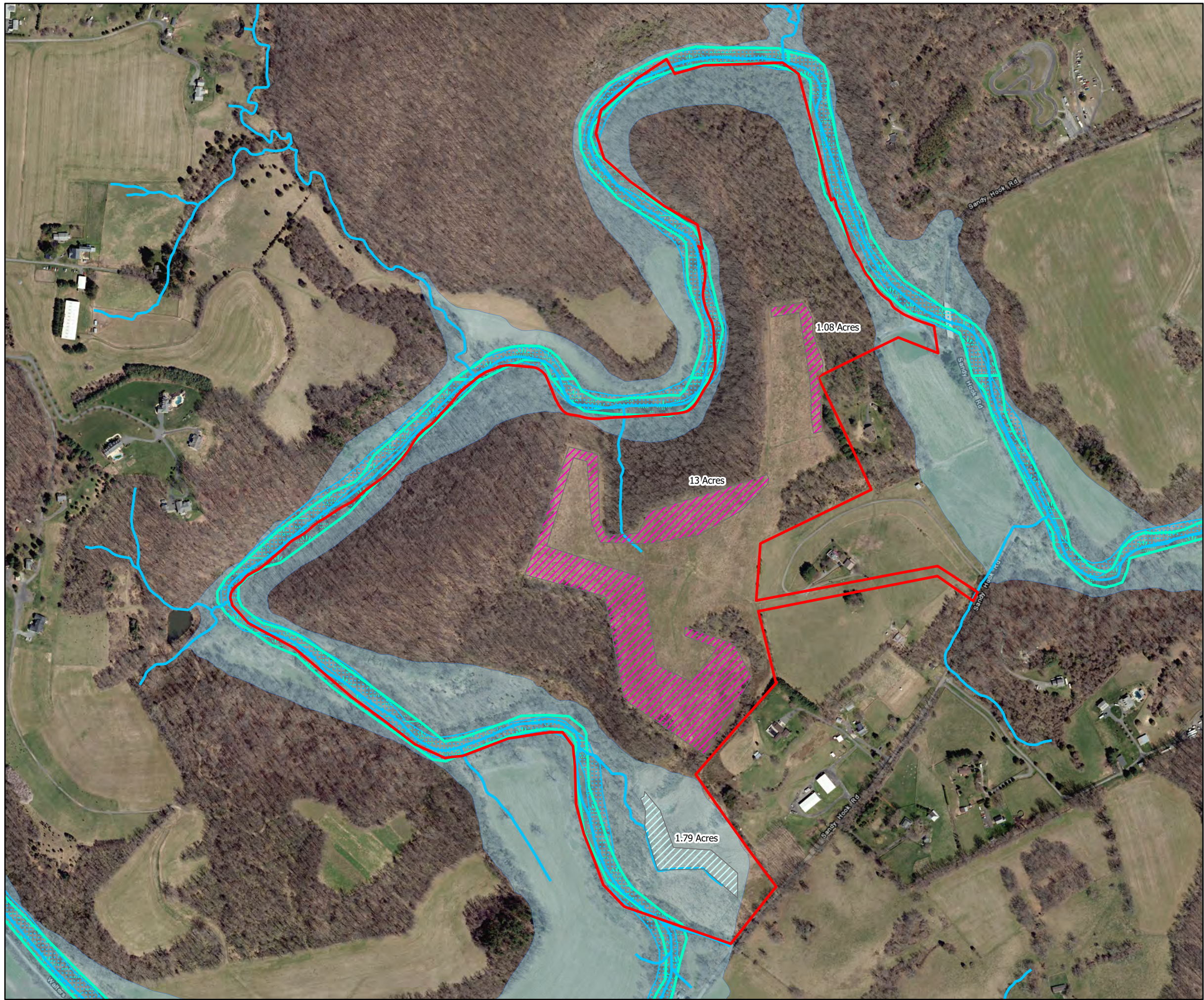
Existing BMPs

The plantings on private property by the Alliance for Chesapeake Bay could also potentially be added to the County's MS4 credit portfolio. Harford County has funded planting on 23 private properties to date for a total planting area of 37 acres and these sites could contribute a total of 38.04 impervious acre credit as forest planting and urban tree canopy BMPs. A table with current private owners participating in this program and the impervious credit associated with each property can be found in **Attachment E**.

NEXT STEPS

Coordination with Parks and Recreation and HCPS is recommended as a next step to review and discuss the feasibility of the BMPs proposed at the top parcels identified for each landowner. During this site review and identification process, RK&K will request feedback from stakeholders on how these land cover conversion BMPs can fit into the future plans. for the recommended parcels as well as other County owned properties.

Attachment A – Top Parks and Recreation Sites

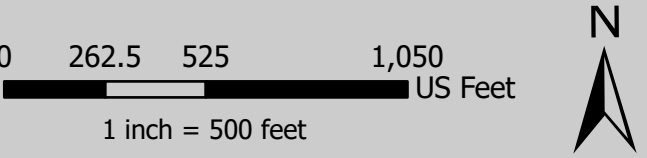


Harford County Parcel Assessment -
Land Cover Conversion BMP Opportunities

Deer Creek Conservation Area
Sandy Hook

Property Acreage: 156.34 Acres
Total BMP Planting Acreage: 15.87 Acres
Total Impervious Acre Credit: 18.17

- BMP Type
- Meadow Planting
 - Forest Planting
 - Riparian Meadow Planting
 - Riparian Forest Planting
 - Urban Tree Canopy
 - Existing Stormwater BMPs
 - Streams
 - DNR Wetlands
 - NWI Wetlands
 - Stream Challenge Grant Sites
 - Forest Conservation Areas
 - 100 Year Floodplain (1% Chance)
 - Floodway (1% Chance)
 - Property Boundary





Harford County Parcel Assessment -
Land Cover Conversion BMP Opportunities

**Schucks Road Regional Sports
Complex**

Property Acreage: 72.18 Acres
Total BMP Planting Acreage: 10.83 Acres
Total Impervious Acre Credit: 12.06

BMP Type

- Meadow Planting
- Forest Planting
- Riparian Meadow Planting
- Riparian Forest Planting
- Urban Tree Canopy
- Existing Stormwater BMPs
- Streams
- DNR Wetlands
- NWI Wetlands
- Stream Challenge Grant Sites
- Forest Conservation Areas
- 100 Year Floodplain (1% Chance)
- Floodway (1% Chance)
- Property Boundary

0 175 350 700 US Feet
1 inch = 333 feet

N



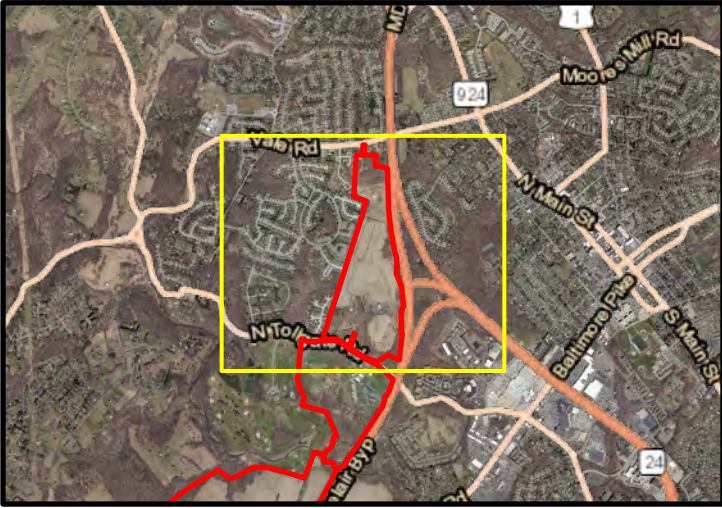
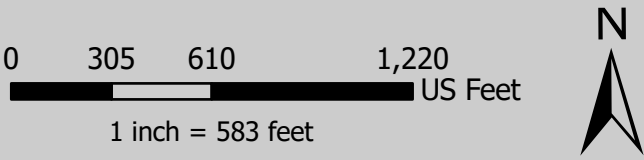


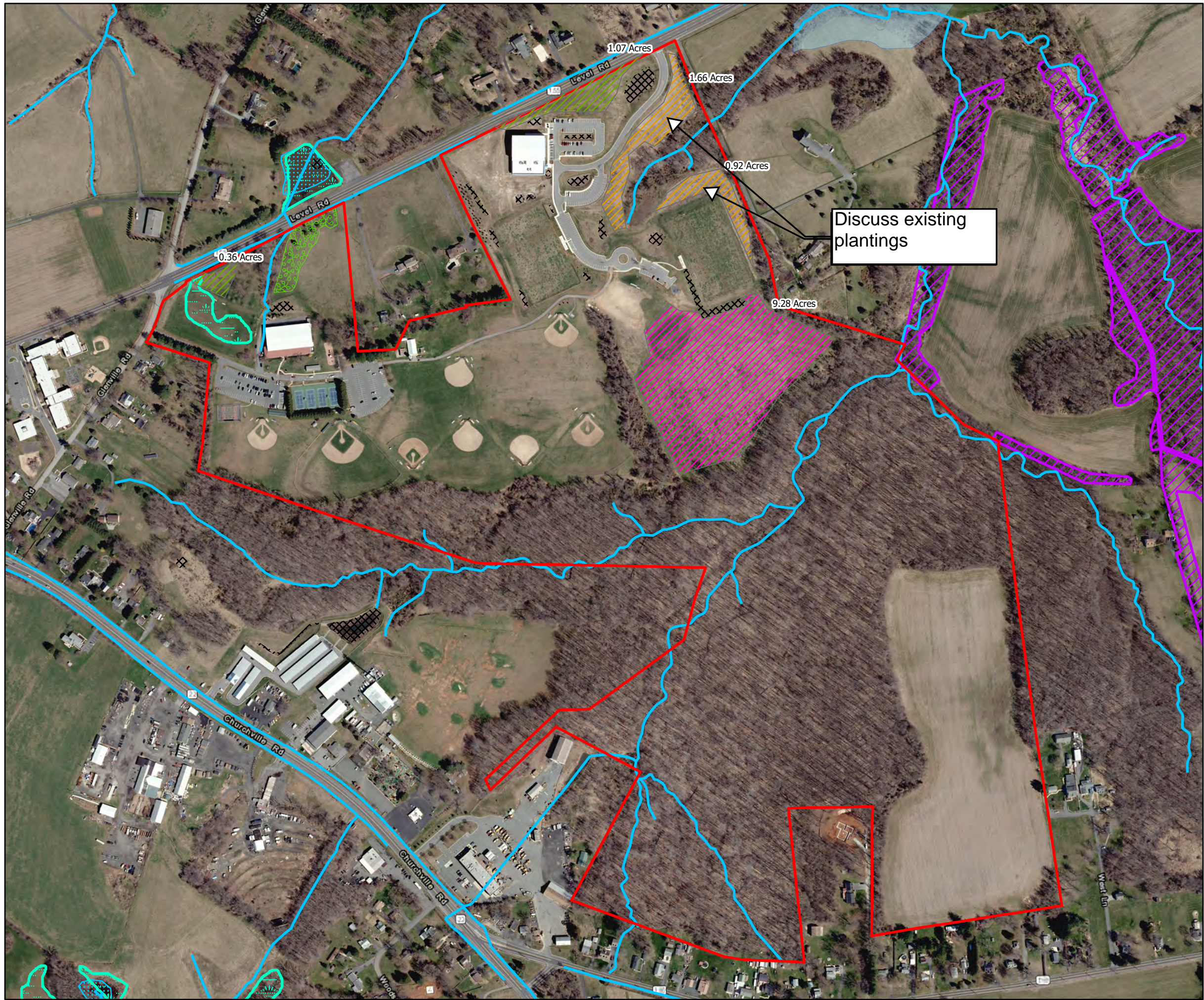
Harford County Parcel Assessment -
Land Cover Conversion BMP Opportunities

Harford County Landfill

Property Acreage: 147.77 Acres
Total BMP Planting Acreage: 32.45 Acres
Total Impervious Acre Credit: 12.01

- BMP Type
- Meadow Planting
 - Forest Planting
 - Riparian Meadow Planting
 - Riparian Forest Planting
 - Urban Tree Canopy
 - Existing Stormwater BMPs
 - Streams
 - DNR Wetlands
 - NWI Wetlands
 - Stream Challenge Grant Sites
 - Forest Conservation Areas
 - 100 Year Floodplain (1% Chance)
 - Floodway (1% Chance)
 - Property Boundary



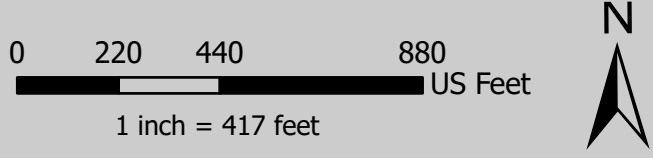


Harford County Parcel Assessment -
Land Cover Conversion BMP Opportunities

Churchville Recreation Complex

Property Acreage: 174.38 Acres
Total BMP Planting Acreage: 13.28 Acres
Total Impervious Acre Credit: 11.45

- BMP Type
- Meadow Planting
 - Forest Planting
 - Riparian Meadow Planting
 - Riparian Forest Planting
 - Urban Tree Canopy
 - Existing Stormwater BMPs
 - Streams
 - DNR Wetlands
 - NWI Wetlands
 - Stream Challenge Grant Sites
 - Forest Conservation Areas
 - 100 Year Floodplain (1% Chance)
 - Floodway (1% Chance)
 - Property Boundary



Harford County Parcel Assessment -
Land Cover Conversion BMP Opportunities















Edgeley Grove Farm

Property Acreage: 282.08 Acres

Total BMP Planting Acreage: 8.49 Acres

Total Impervious Acre Credit: 7.61

BMP Type

-  Meadow Planting
-  Forest Planting
-  Riparian Meadow Planting
-  Riparian Forest Planting
-  Urban Tree Canopy
-  Existing Stormwater BMPs
-  Streams
-  DNR Wetlands
-  NWI Wetlands
-  Stream Challenge Grant Sites
-  Forest Conservation Areas
-  100 Year Floodplain (1% Chance)
-  Floodway (1% Chance)
-  Property Boundary

0 305 610 1,220

US Feet

1 inch = 583 feet



August 2021

Map 5 of 10



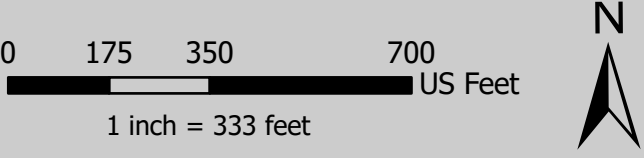


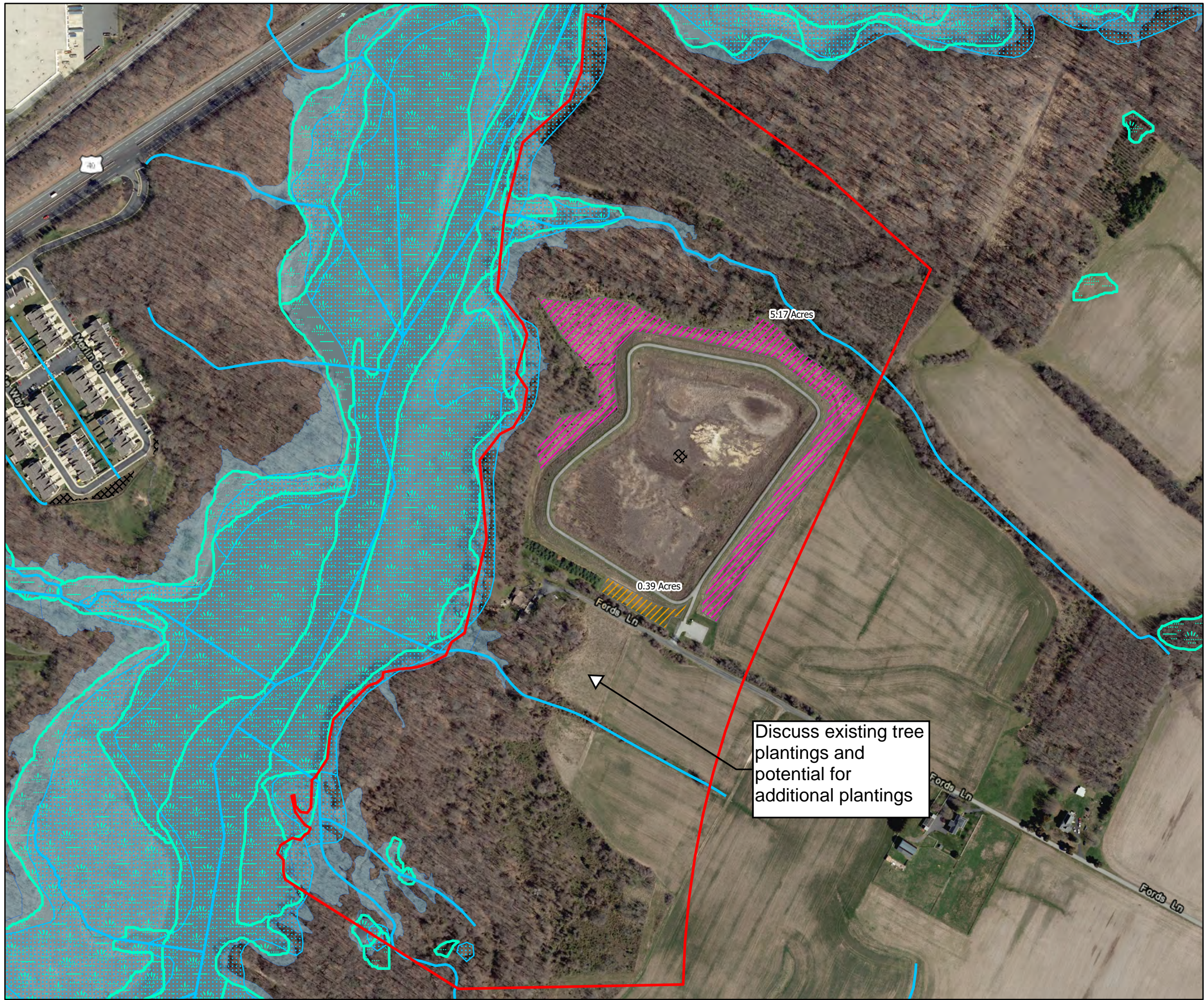
Harford County Parcel Assessment -
Land Cover Conversion BMP Opportunities

Edgewater Village Park

Property Acreage: 61.14 Acres
Total BMP Planting Acreage: 6.98 Acres
Total Impervious Acre Credit: 5.87

- BMP Type
- Meadow Planting
 - Forest Planting
 - Riparian Meadow Planting
 - Riparian Forest Planting
 - Urban Tree Canopy
 - Existing Stormwater BMPs
 - Streams
 - DNR Wetlands
 - NWI Wetlands
 - Stream Challenge Grant Sites
 - Forest Conservation Areas
 - 100 Year Floodplain (1% Chance)
 - Floodway (1% Chance)
 - Property Boundary





Harford County Parcel Assessment -
Land Cover Conversion BMP Opportunities

Perryman Park

Property Acreage: 89.51 Acres
Total BMP Planting Acreage: 5.57 Acres
Total Impervious Acre Credit: 5.80

BMP Type

- Meadow Planting
- Forest Planting
- Riparian Meadow Planting
- Riparian Forest Planting
- Urban Tree Canopy
- Existing Stormwater BMPs
- Streams
- DNR Wetlands
- NWI Wetlands
- Stream Challenge Grant Sites
- Forest Conservation Areas
- 100 Year Floodplain (1% Chance)
- Floodway (1% Chance)
- Property Boundary

0 175 350 700 US Feet
1 inch = 333 feet

N





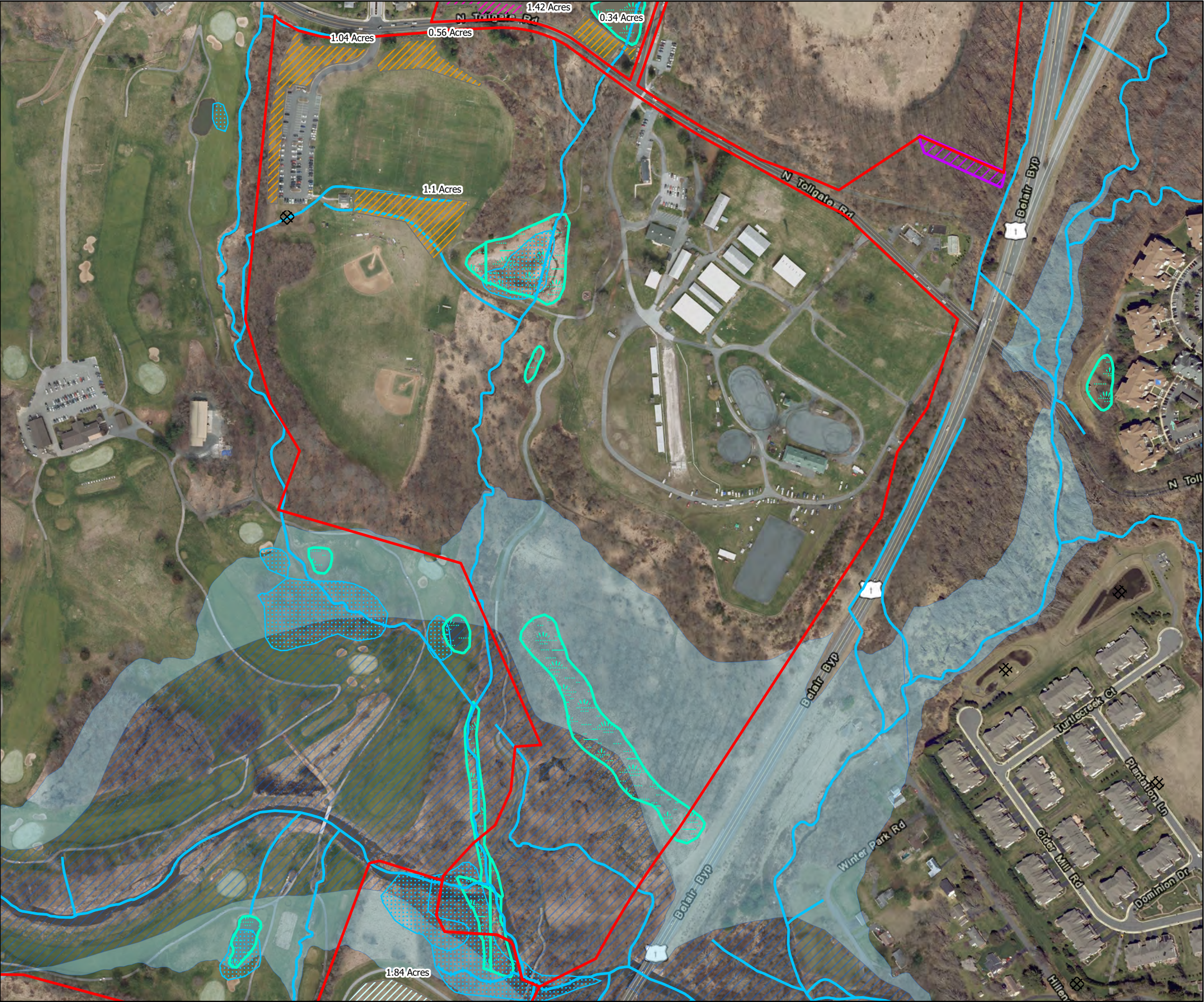
Harford County Parcel Assessment -
Land Cover Conversion BMP Opportunities

**Cedar Lane Park Regional Field
Sports Complex**

Property Acreage: 110.24 Acres
Total BMP Planting Acreage: 8.18 Acres
Total Impervious Acre Credit: 4.30

- BMP Type
- Meadow Planting
 - Forest Planting
 - Riparian Meadow Planting
 - Riparian Forest Planting
 - Urban Tree Canopy
 - Existing Stormwater BMPs
 - Streams
 - DNR Wetlands
 - NWI Wetlands
 - Stream Challenge Grant Sites
 - Forest Conservation Areas
 - 100 Year Floodplain (1% Chance)
 - Floodway (1% Chance)
 - Property Boundary



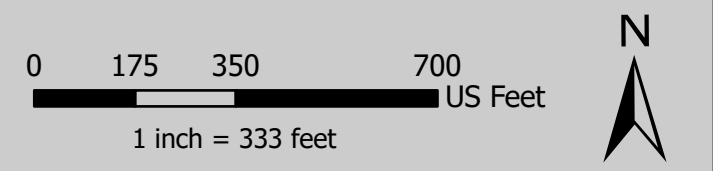


Harford County Parcel Assessment -
Land Cover Conversion BMP Opportunities

Heavenly Waters Park

Property Acreage: 108.91 Acres
Total BMP Planting Acreage: 4.47 Acres
Total Impervious Acre Credit: 2.42

- BMP Type
- Meadow Planting
 - Forest Planting
 - Riparian Meadow Planting
 - Riparian Forest Planting
 - Urban Tree Canopy
 - Existing Stormwater BMPs
 - Streams
 - DNR Wetlands
 - NWI Wetlands
 - Stream Challenge Grant Sites
 - Forest Conservation Areas
 - 100 Year Floodplain (1% Chance)
 - Floodway (1% Chance)
 - Property Boundary



Harford County Parcel Assessment -
Land Cover Conversion BMP Opportunities


Prospect Mill Park

Property Acreage: 34.29 Acres

Total BMP Planting Acreage: 1.38 Acres

Total Impervious Acre Credit: 1.47


BMP Type

 Meadow Planting


 Forest Planting

 Riparian Meadow Planting

 Riparian Forest Planting


 Urban Tree Canopy

 Existing Stormwater BMPs

 Streams


 DNR Wetlands

 NWI Wetlands

 Stream Challenge Grant Sites

 Forest Conservation Areas

 100 Year Floodplain (1% Chance)

 Floodway (1% Chance)

 Property Boundary

0 87.5 175 350
US Feet
1 inch = 167 feet



Existing Arbor Day
Plantings



August 2021
Map 10 of 10



Attachment B – Top Harford County Public School Sites



Harford County Parcel Assessment -
Land Cover Conversion BMP Opportunities















Magnolia ES, Magnolia MS

Property Acreage: 84.79 Acres

Total BMP Planting Acreage: 9.05 Acres

Total Impervious Acre Credit: 3.02

BMP Type

-  Meadow Planting
-  Forest Planting
-  Riparian Meadow Planting
-  Riparian Forest Planting
-  Urban Tree Canopy
-  Streams
-  DNR Wetlands
-  NWI Wetlands
-  Forest Conservation Areas
-  Stream Challenge Grant Sites
-  100 Year Floodplain (1% Chance)
-  Floodway (1% Chance)
-  Existing Stormwater BMPs
-  Property Boundary

0 130 260 520
US Feet
1 inch = 250 feet



August 2021

Map 1 of 9



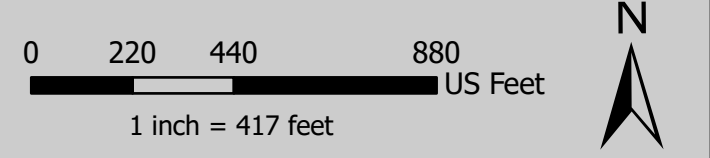


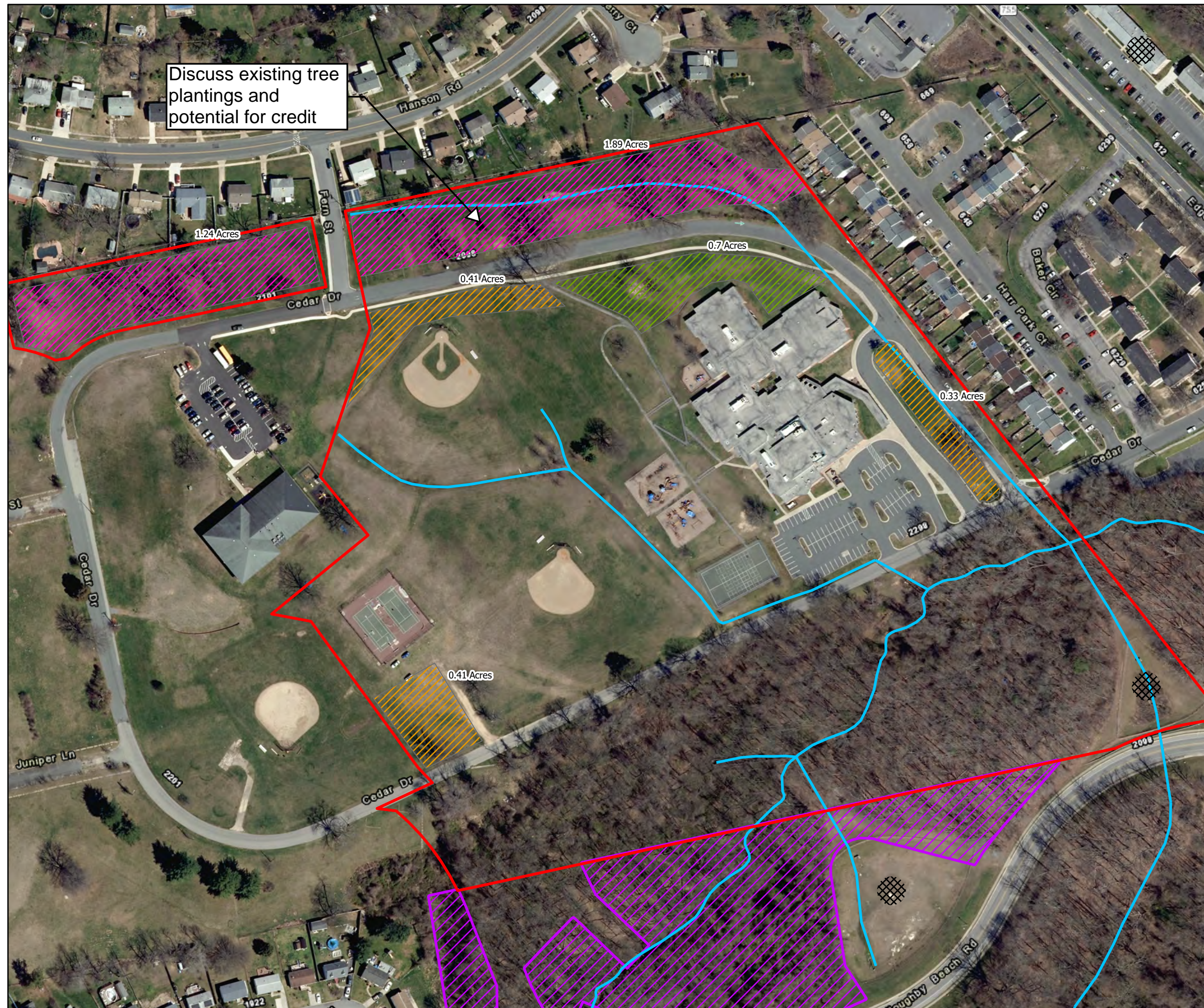
Harford County Parcel Assessment -
Land Cover Conversion BMP Opportunities

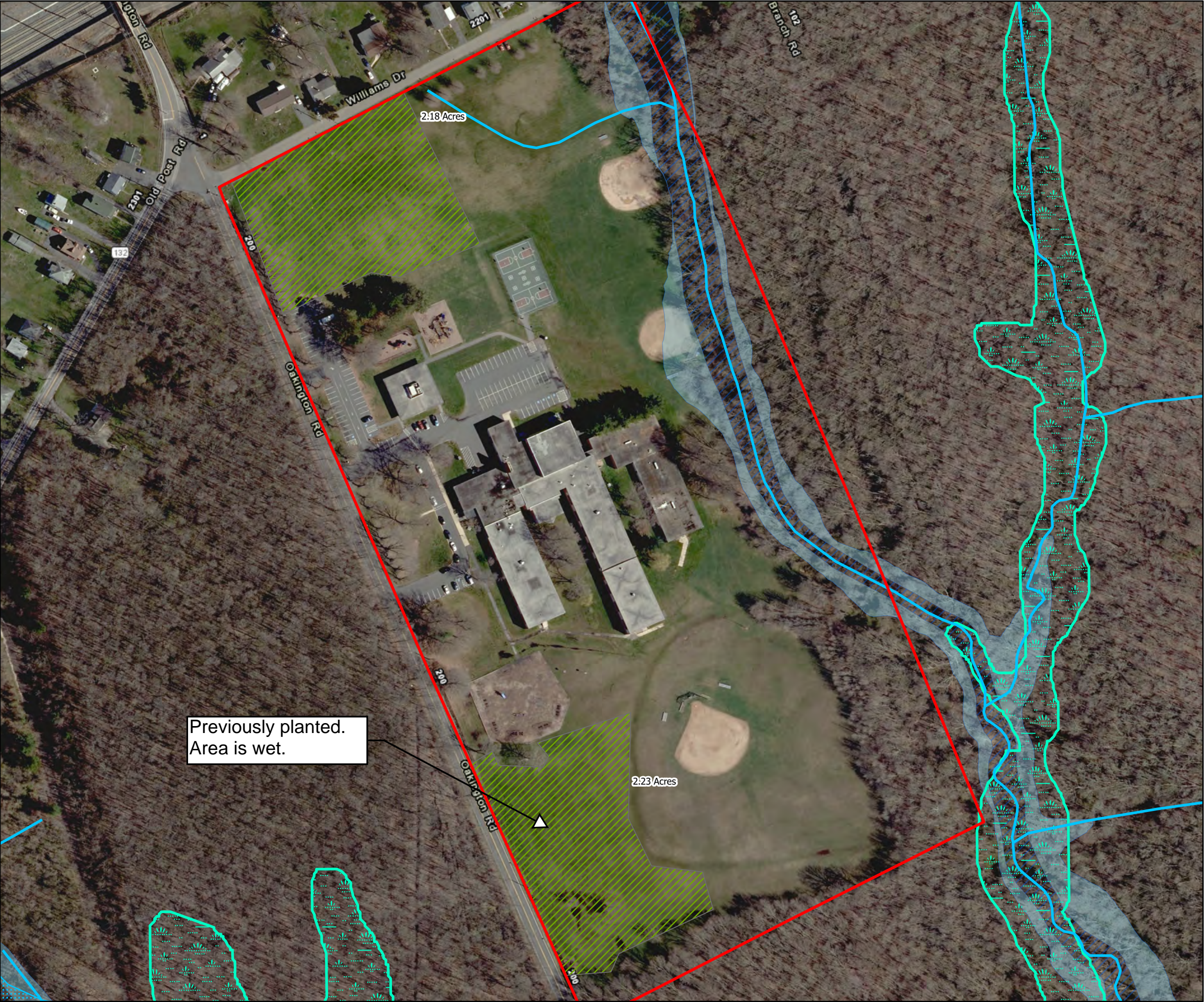
**North Harford ES, North Harford
MS, North Harford HS**

Property Acreage: 126.14 Acres
Total BMP Planting Acreage: 7.73 Acres
Total Impervious Acre Credit: 3.32

- BMP Type**
- Meadow Planting
 - Forest Planting
 - Riparian Meadow Planting
 - Riparian Forest Planting
 - Urban Tree Canopy
 - Streams
 - DNR Wetlands
 - NWI Wetlands
 - Forest Conservation Areas
 - Stream Challenge Grant Sites
 - 100 Year Floodplain (1% Chance)
 - Floodway (1% Chance)
 - Existing Stormwater BMPs
 - Property Boundary







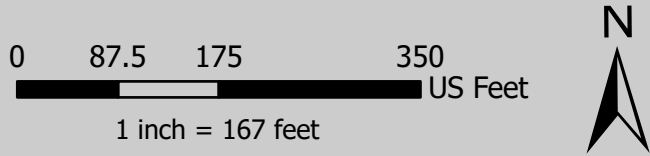
Harford County Parcel Assessment -
Land Cover Conversion BMP Opportunities

Roye-Williams ES

Property Acreage: 29.19 Acres
Total BMP Planting Acreage: 4.41 Acres
Total Impervious Acre Credit: 1.63

BMP Type

- Meadow Planting
- Forest Planting
- Riparian Meadow Planting
- Riparian Forest Planting
- Urban Tree Canopy
- Streams
- DNR Wetlands
- NWI Wetlands
- Forest Conservation Areas
- Stream Challenge Grant Sites
- 100 Year Floodplain (1% Chance)
- Floodway (1% Chance)
- Existing Stormwater BMPs
- Property Boundary





Harford County Parcel Assessment - Land Cover Conversion BMP Opportunities

Aberdeen MS

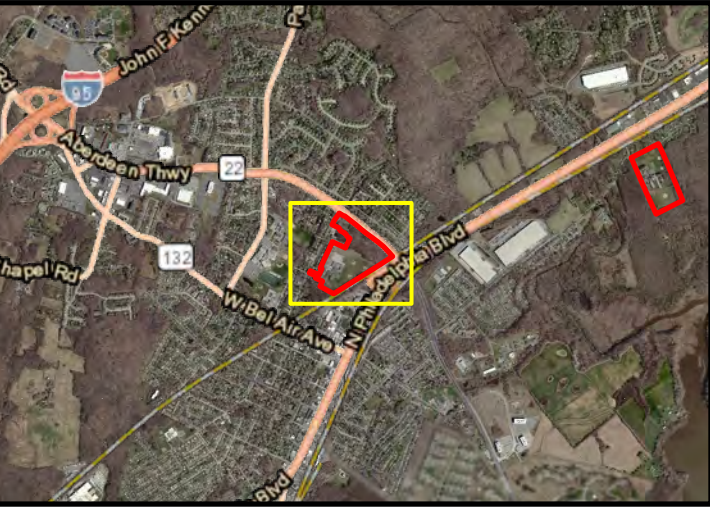
Property Acreage: 44.75 Acres
Total BMP Planting Acreage: 4.55 Acres
Total Impervious Acre Credit: 1.49

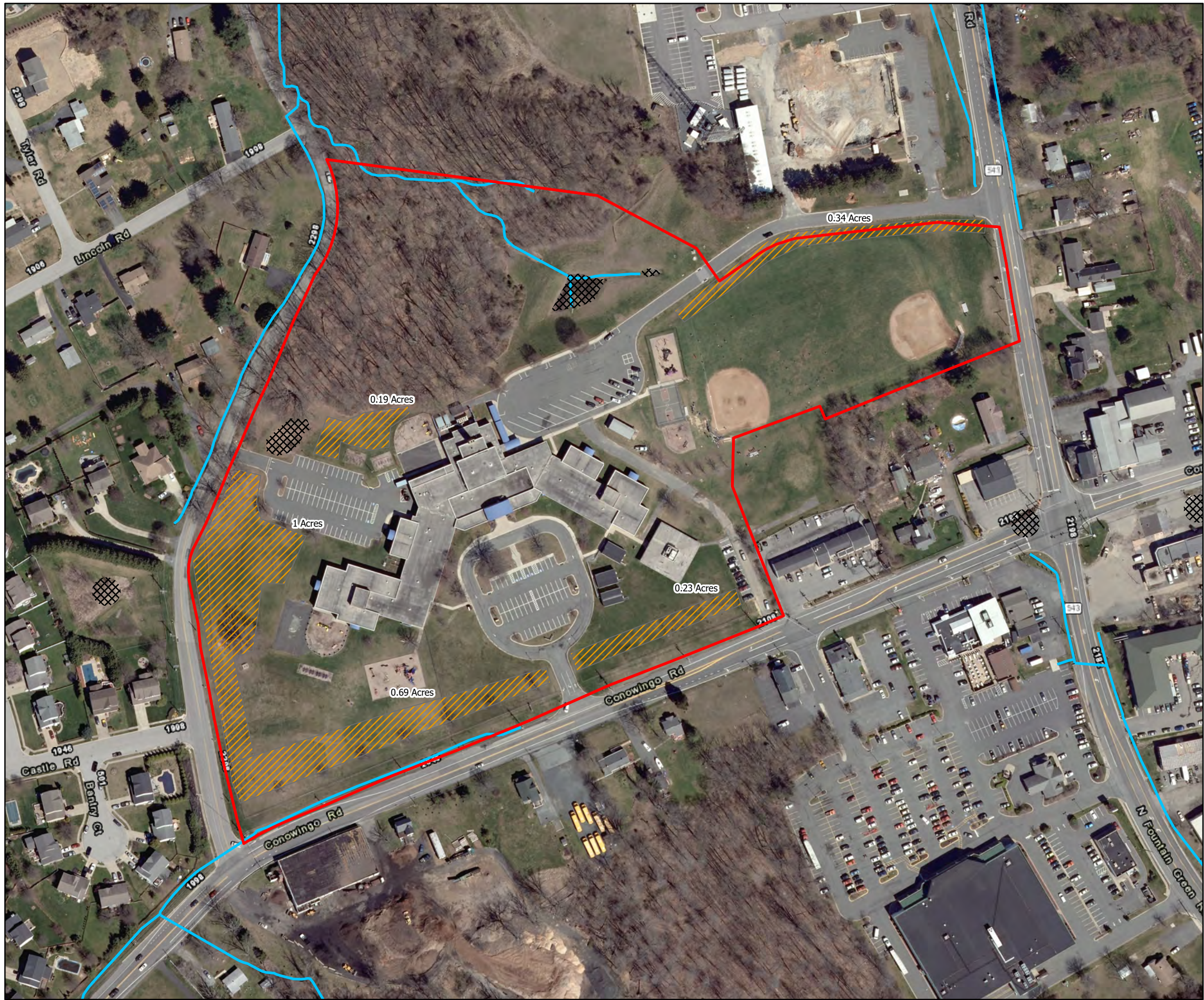
BMP Type

- Meadow Planting
- Forest Planting
- Riparian Meadow Planting
- Riparian Forest Planting
- Urban Tree Canopy
- Streams
- DNR Wetlands
- NWI Wetlands
- Forest Conservation Areas
- Stream Challenge Grant Sites
- 100 Year Floodplain (1% Chance)
- Floodway (1% Chance)
- Existing Stormwater BMPs
- Property Boundary

0 130 260 520 US Feet
1 inch = 250 feet

N





Harford County Parcel Assessment -
Land Cover Conversion BMP Opportunities

Hickory ES

Property Acreage: 22.13 Acres
Total BMP Planting Acreage: 2.46 Acres
Total Impervious Acre Credit: 0.69

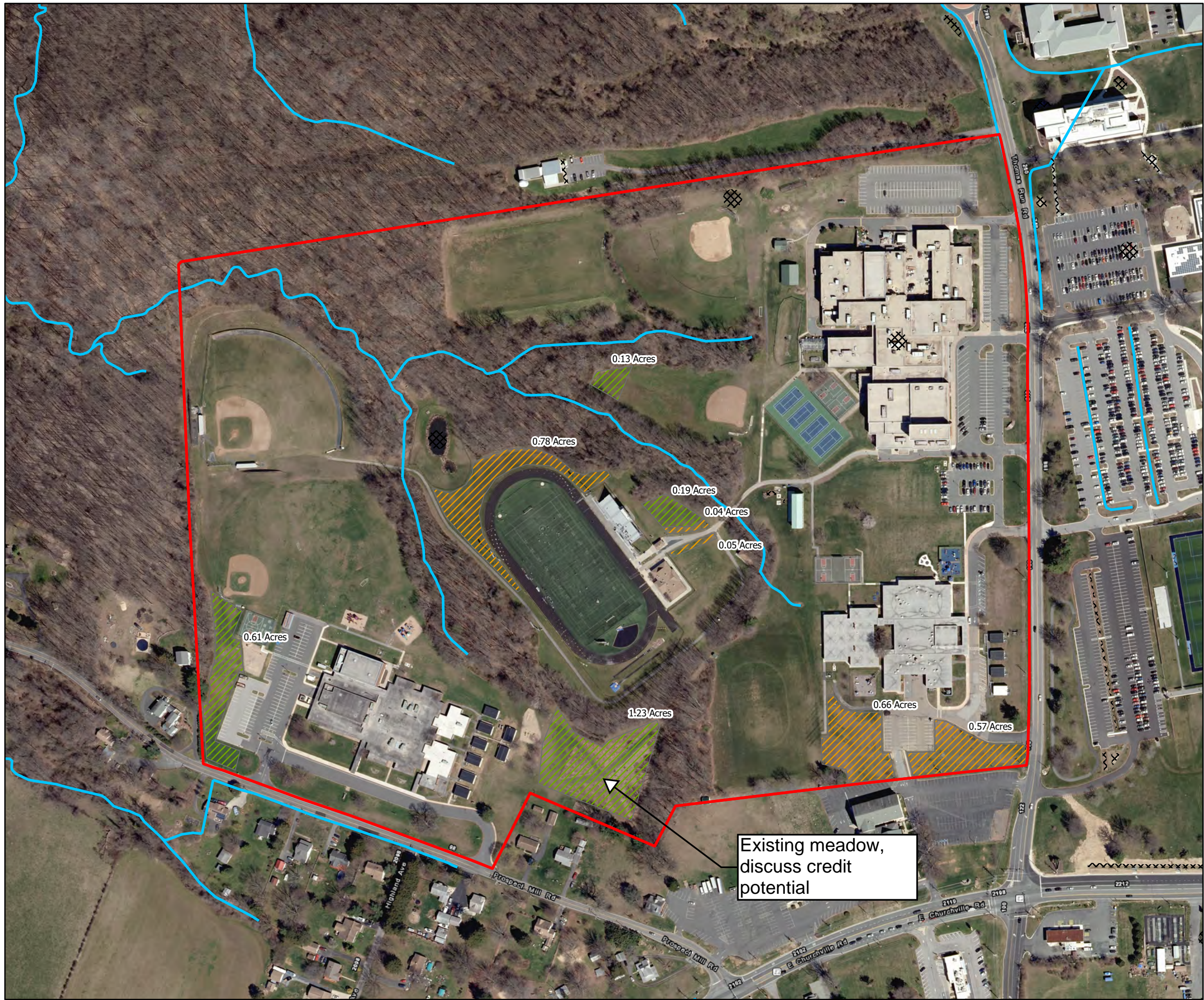
BMP Type

- Meadow Planting
- Forest Planting
- Riparian Meadow Planting
- Riparian Forest Planting
- Urban Tree Canopy
- Streams
- DNR Wetlands
- NWI Wetlands
- Forest Conservation Areas
- Stream Challenge Grant Sites
- 100 Year Floodplain (1% Chance)
- Floodway (1% Chance)
- Existing Stormwater BMPs
- Property Boundary

0 87.5 175 350 US Feet
1 inch = 167 feet

N





Harford County Parcel Assessment -
Land Cover Conversion BMP Opportunities

**John Archer Sp Ed, Prospect Mill
ES, Harford Technical HS**

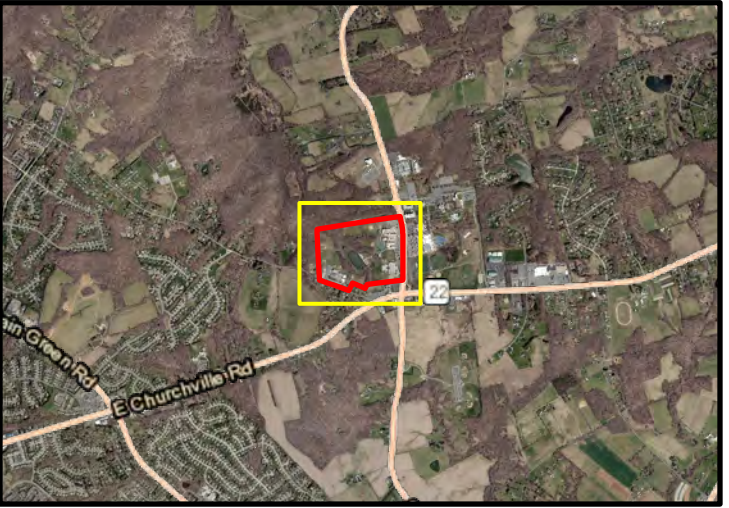
Property Acreage: 81.03 Acres
Total BMP Planting Acreage: 4.25 Acres
Total Impervious Acre Credit: 1.39

BMP Type

- Meadow Planting
- Forest Planting
- Riparian Meadow Planting
- Riparian Forest Planting
- Urban Tree Canopy
- Streams
- DNR Wetlands
- NWI Wetlands
- Forest Conservation Areas
- Stream Challenge Grant Sites
- 100 Year Floodplain (1% Chance)
- Floodway (1% Chance)
- Existing Stormwater BMPs
- Property Boundary

0 130 260 520 US Feet
1 inch = 250 feet

N





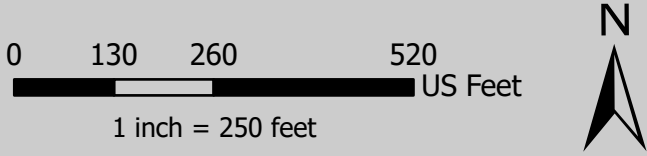
Harford County Parcel Assessment -
Land Cover Conversion BMP Opportunities

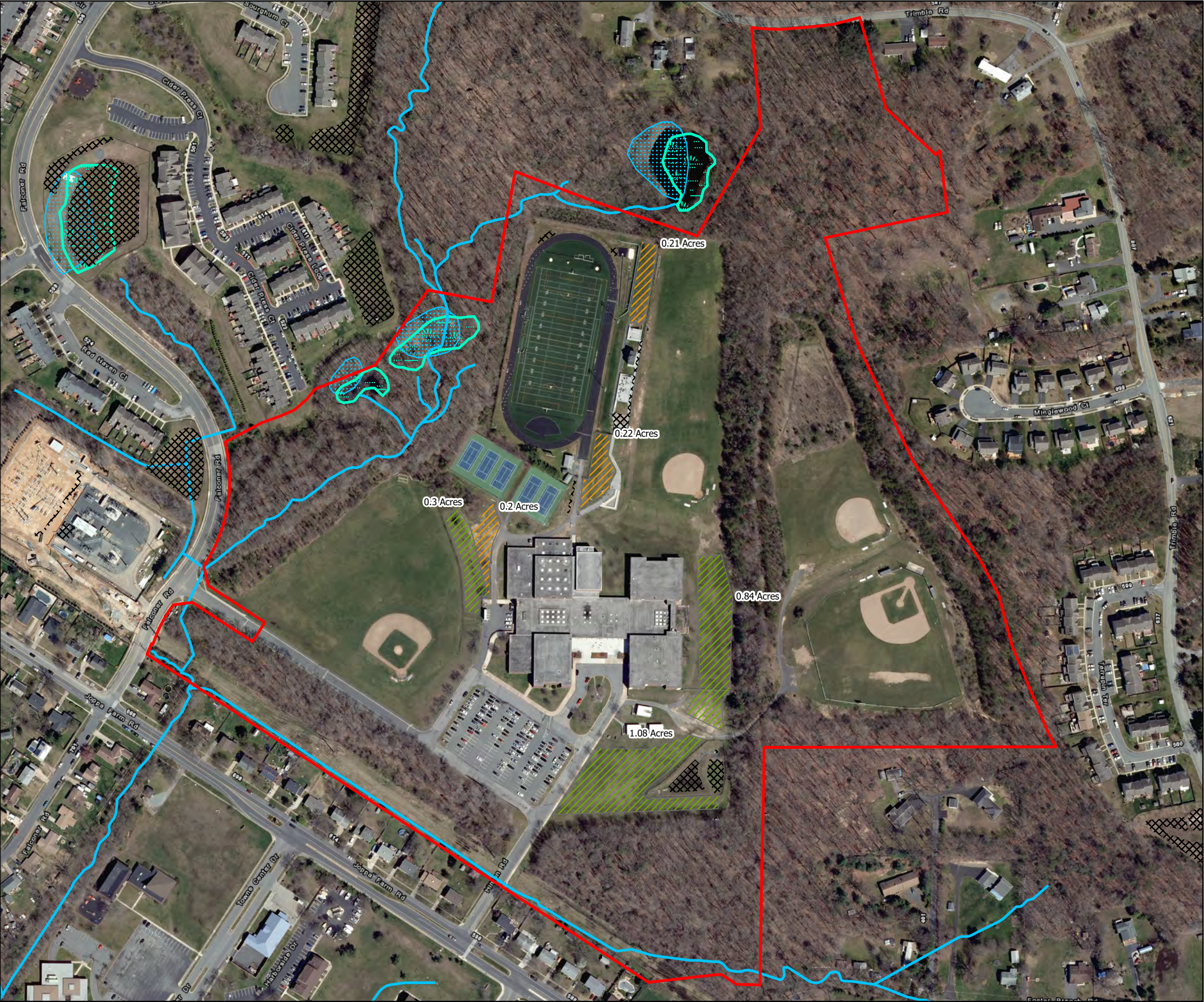
Red Pump ES

Property Acreage: 43.88 Acres
Total BMP Planting Acreage: 5.41 Acres
Total Impervious Acre Credit: 1.58

BMP Type

- Meadow Planting
- Forest Planting
- Riparian Meadow Planting
- Riparian Forest Planting
- Urban Tree Canopy
- Streams
- DNR Wetlands
- NWI Wetlands
- Forest Conservation Areas
- Stream Challenge Grant Sites
- 100 Year Floodplain (1% Chance)
- Floodway (1% Chance)
- Existing Stormwater BMPs
- Property Boundary



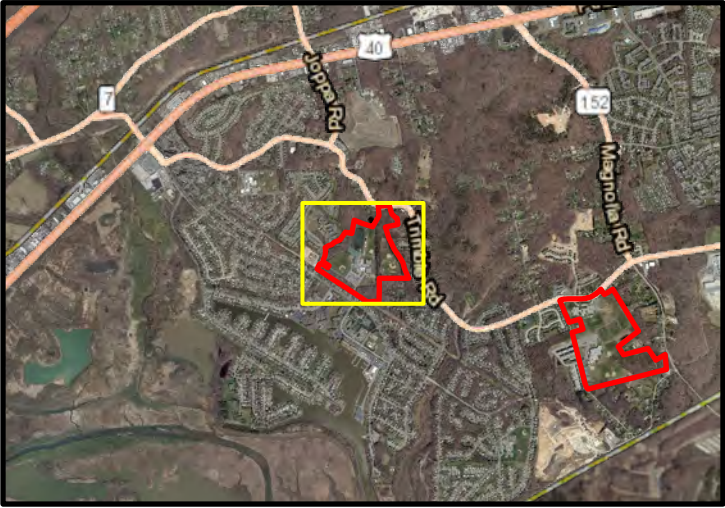
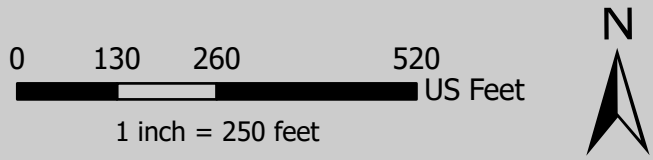


Harford County Parcel Assessment -
Land Cover Conversion BMP Opportunities

Joppatowne HS

Property Acreage: 69.77 Acres
Total BMP Planting Acreage: 2.83 Acres
Total Impervious Acre Credit: 0.99

- BMP Type**
- Meadow Planting
 - Forest Planting
 - Riparian Meadow Planting
 - Riparian Forest Planting
 - Urban Tree Canopy
 - Streams
 - DNR Wetlands
 - NWI Wetlands
 - Forest Conservation Areas
 - Stream Challenge Grant Sites
 - 100 Year Floodplain (1% Chance)
 - Floodway (1% Chance)
 - Existing Stormwater BMPs
 - Property Boundary



Attachment C – The Grove

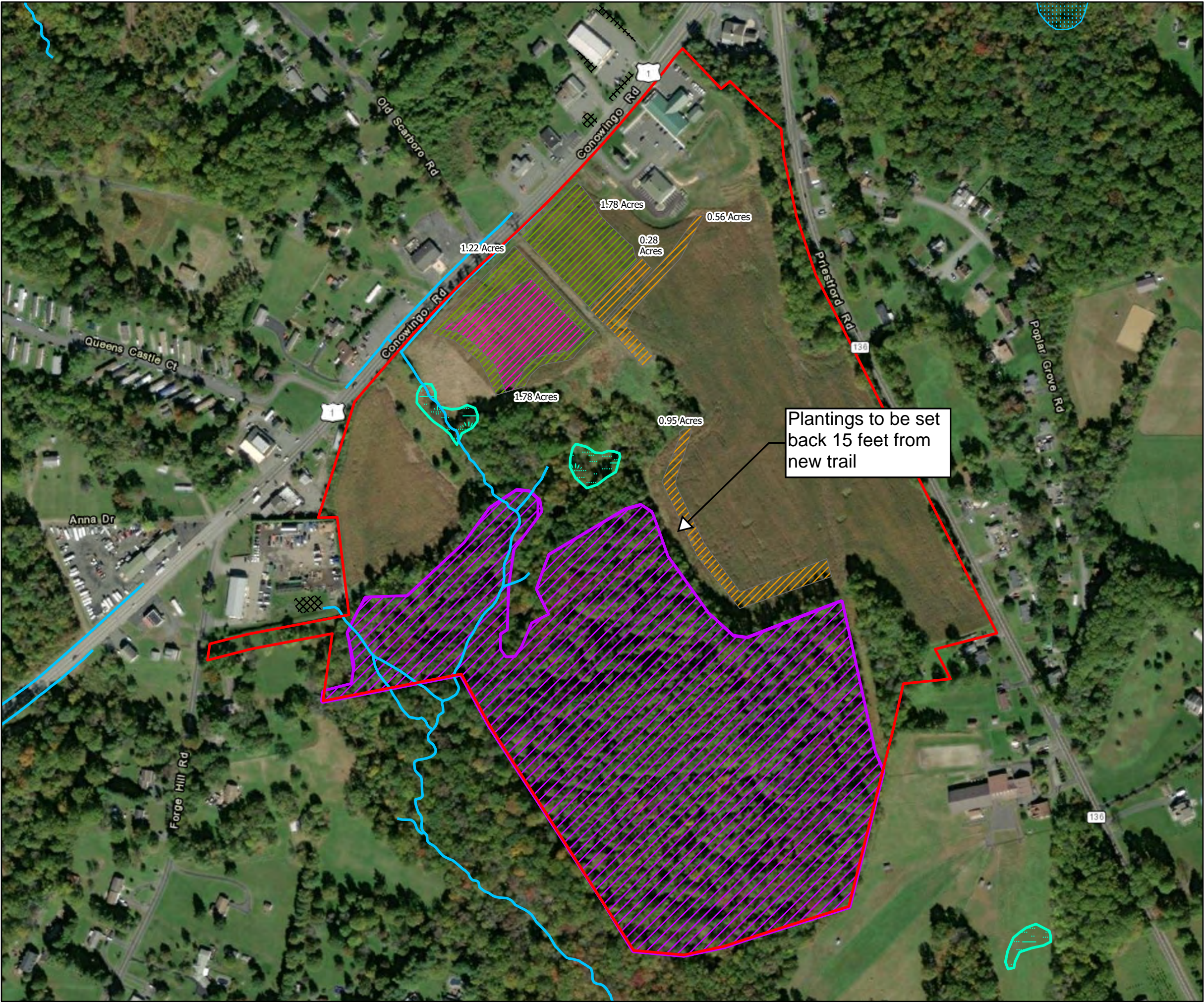
The Grove

Property Acreage: 87.27 Acres
Total BMP Planting Acreage: 6.56 Acres
Total Impervious Acre Credit: 3.57

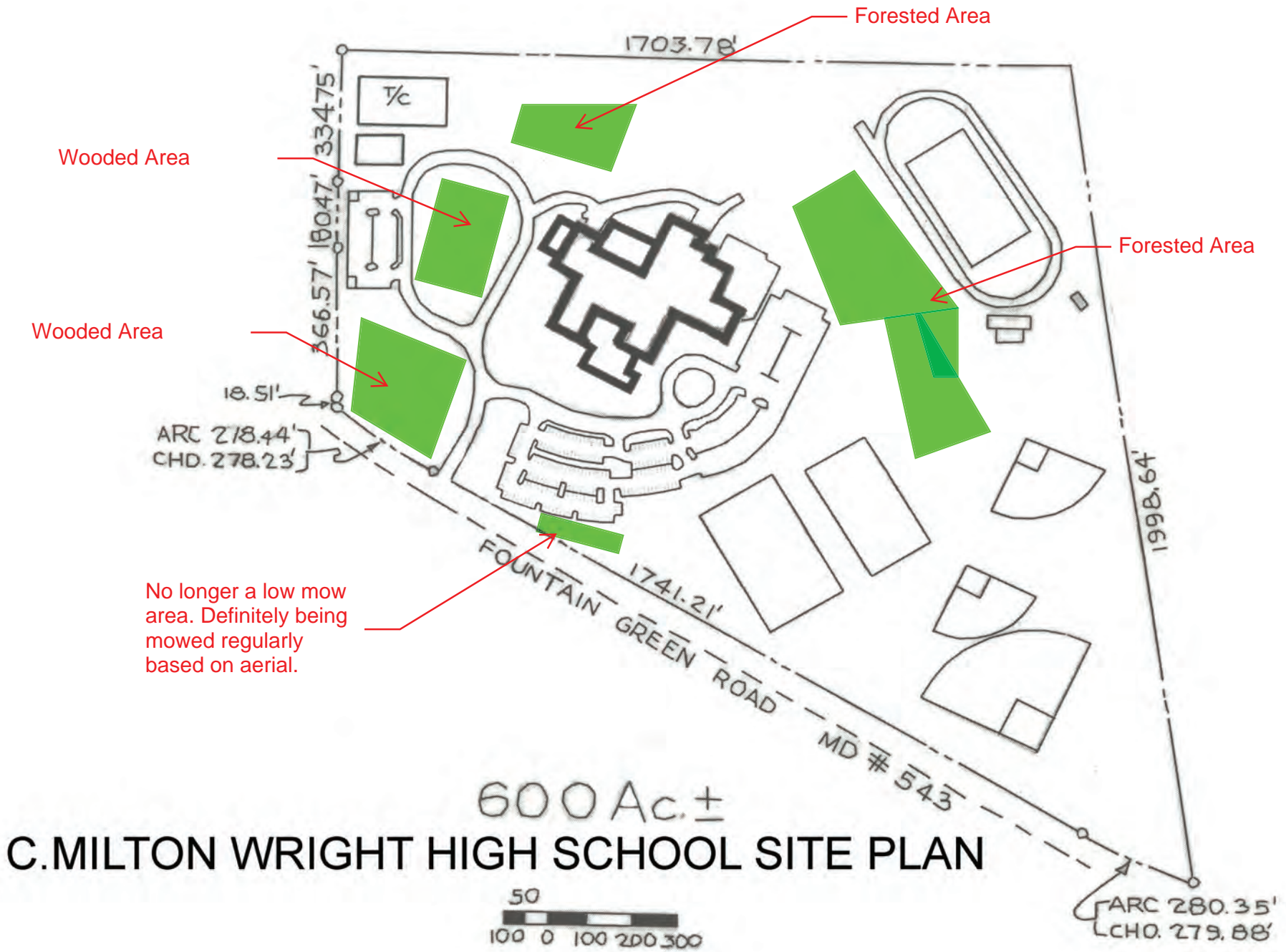
BMP Type

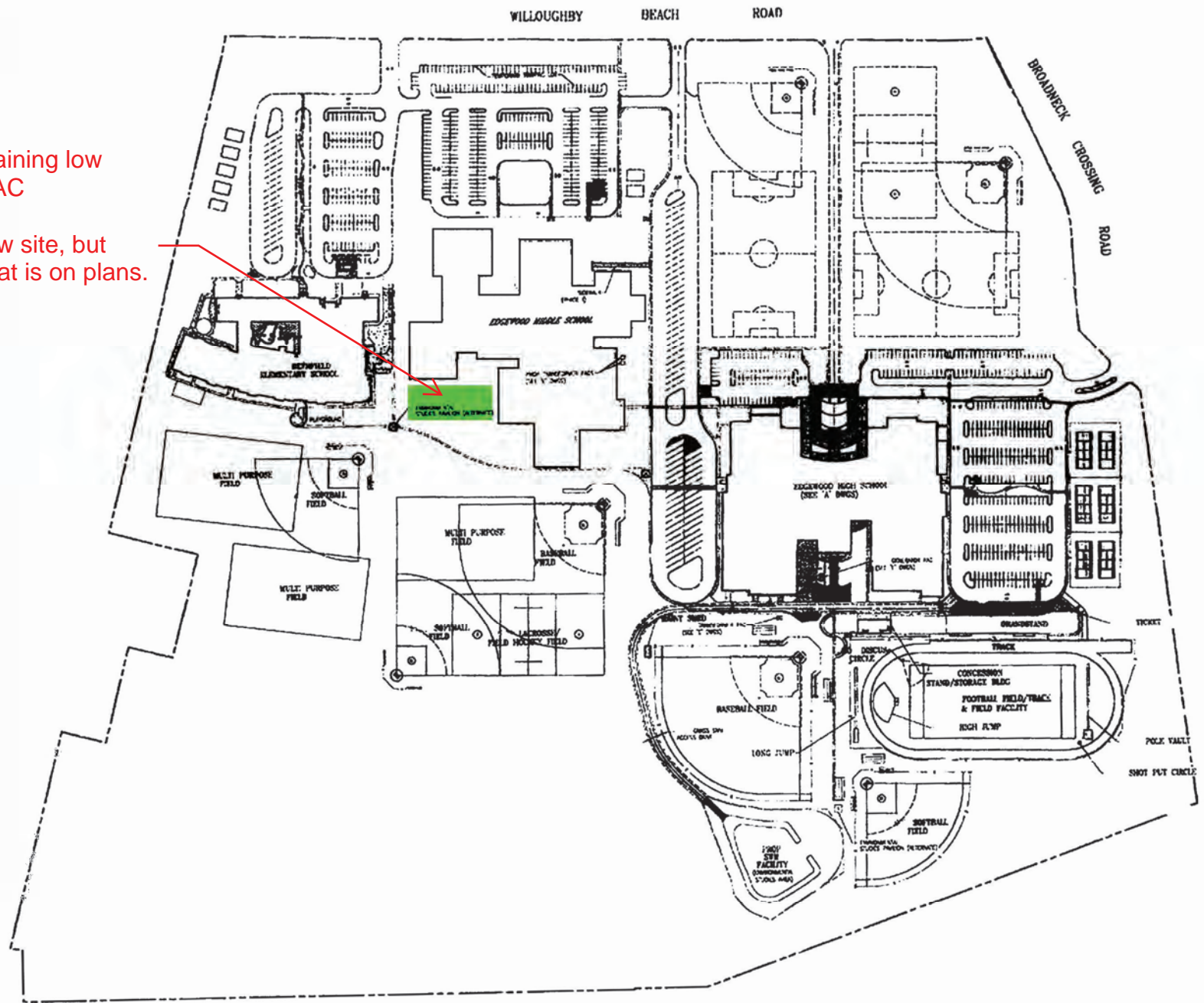
- Meadow Planting
- Forest Planting
- Riparian Meadow Planting
- Riparian Forest Planting
- Urban Tree Canopy
- Streams
- DNR Wetlands
- NWI Wetlands
- Stream Challenge Grant Sites
- Forest Conservation Areas
- 100 Year Floodplain (1% Chance)
- Floodway (1% Chance)
- Existing Stormwater BMPs
- Property Boundary

0 162.5 325 650 US Feet
1 inch = 312 feet



Attachment D – Harford County Low Mow Site Plans

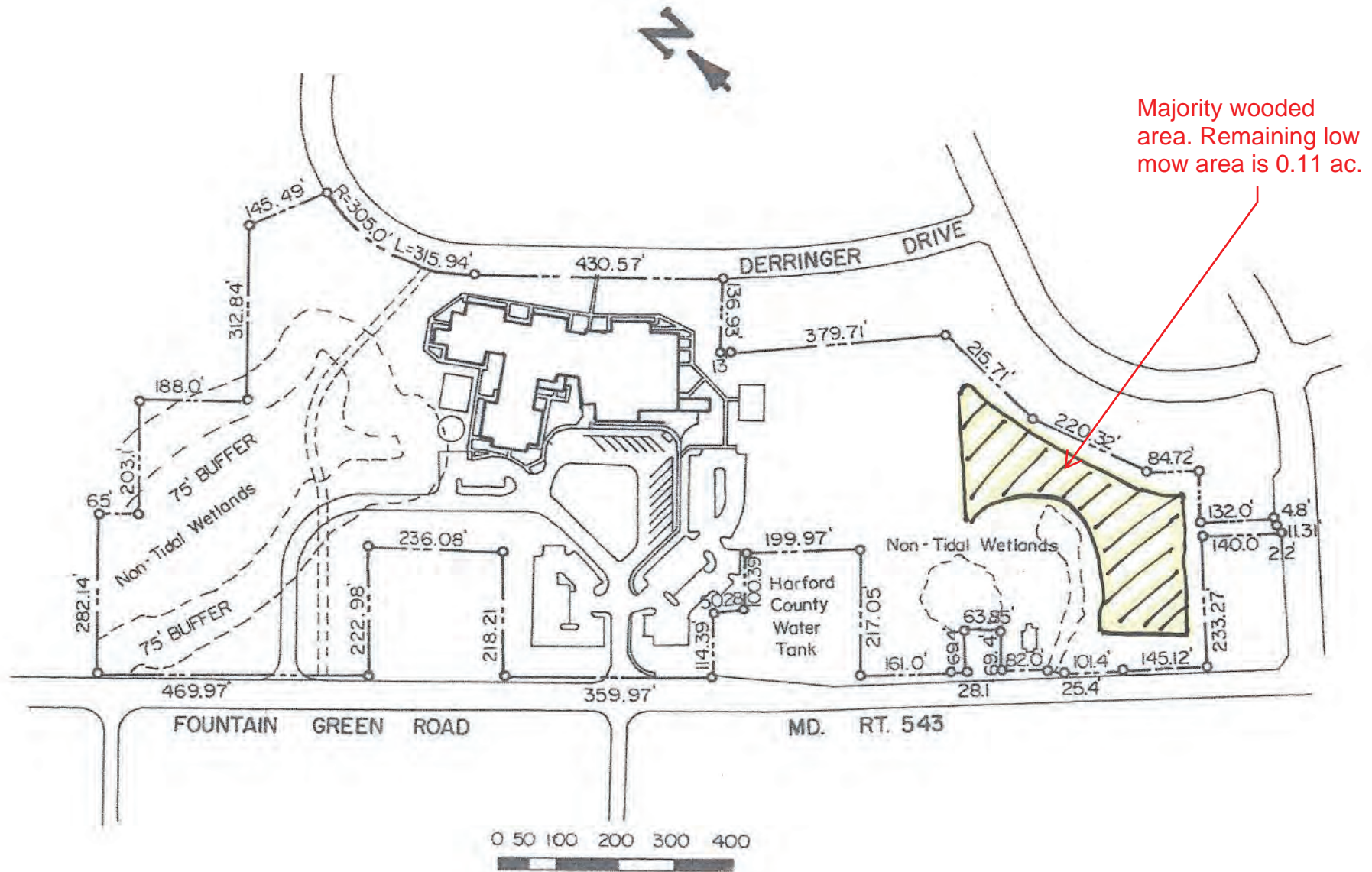




Acreage of remaining low mow site: 0.22 AC

Existing low mow site, but smaller than what is on plans.

EDGEWOOD HIGH SCHOOL - DEERFIELD ELEMENTARY SCHOOL
EDGEWOOD MIDDLE SCHOOL SITE PLAN

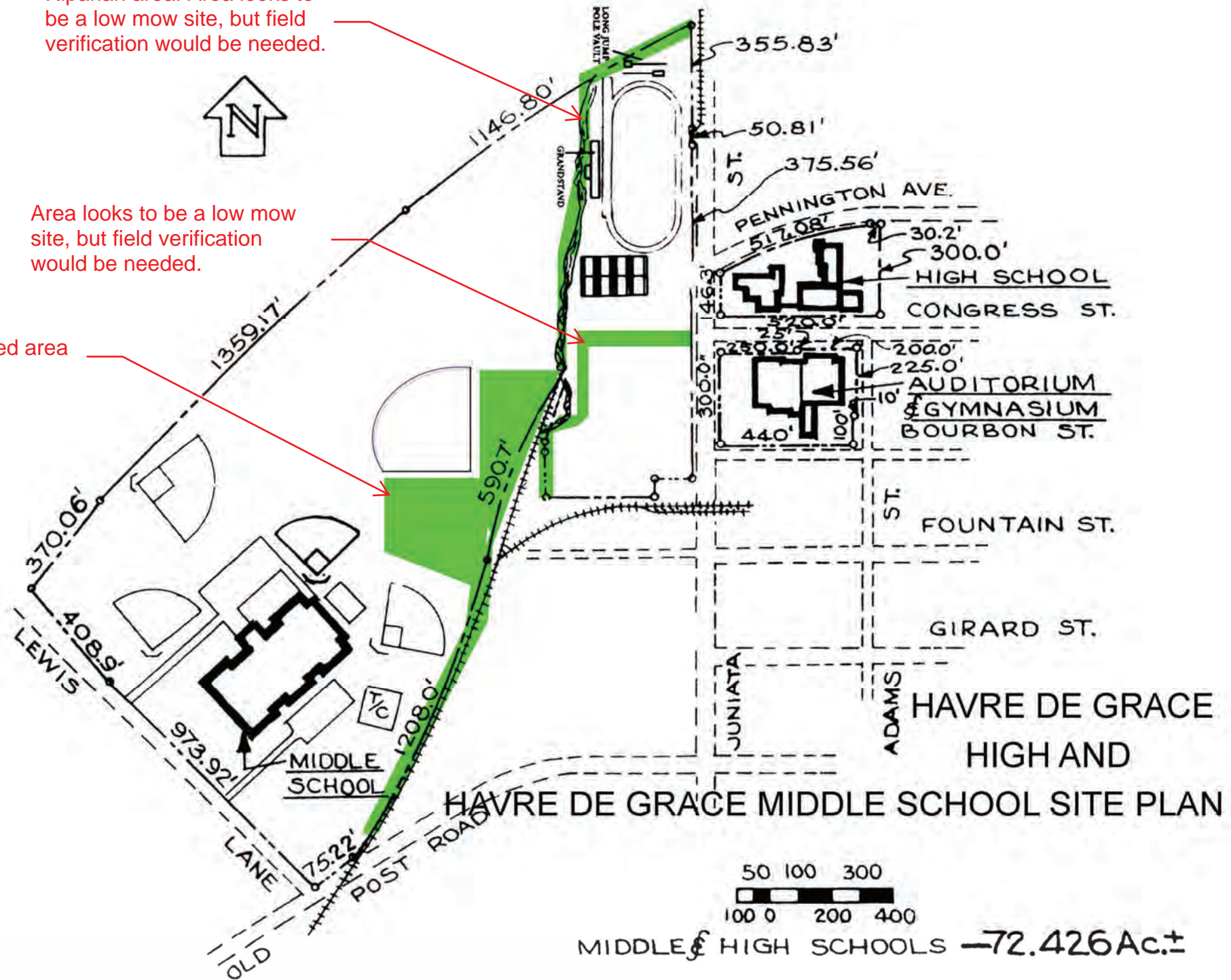


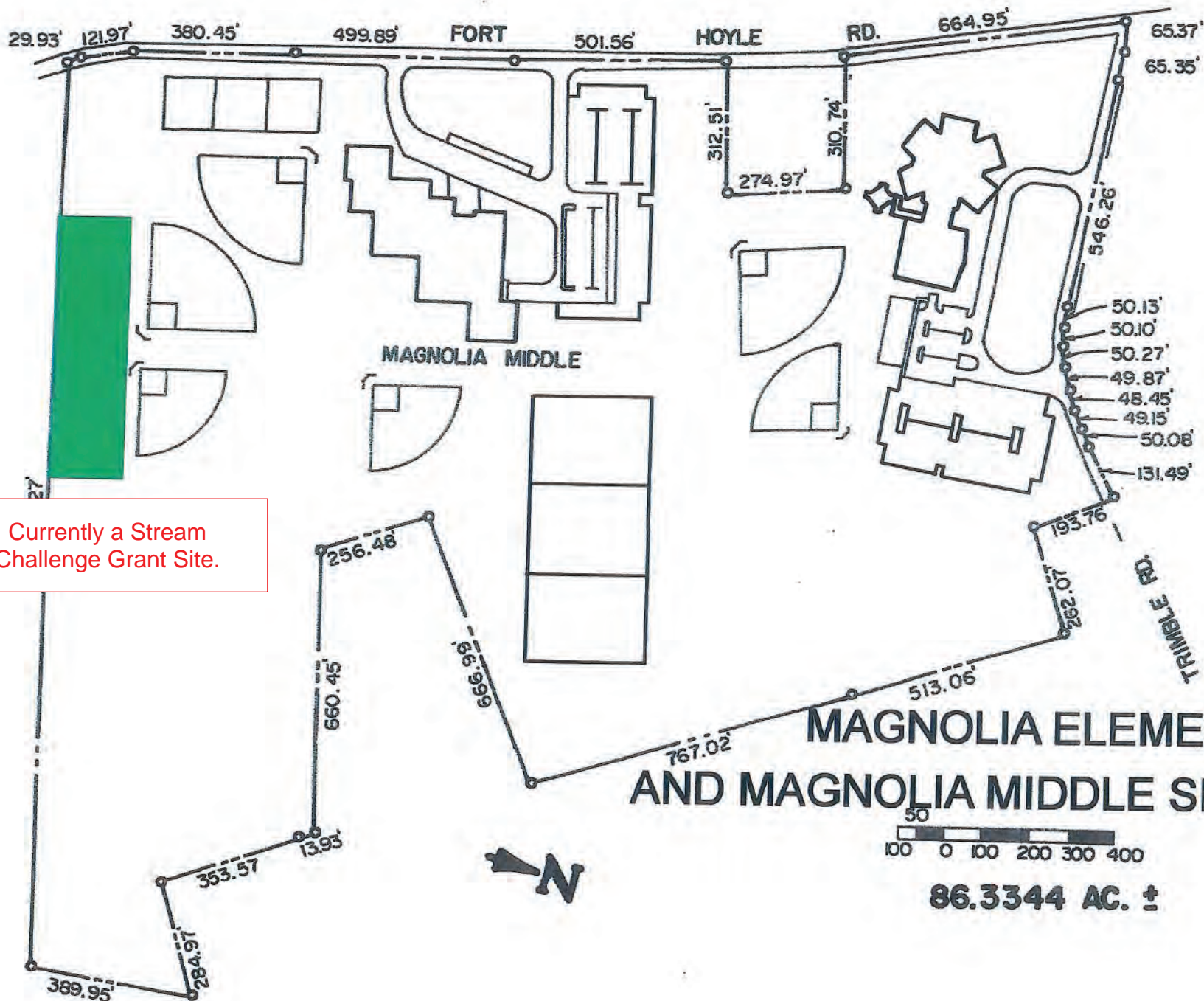
FOUNTAIN GREEN ELEMENTARY

Riparian area. Area looks to be a low mow site, but field verification would be needed.

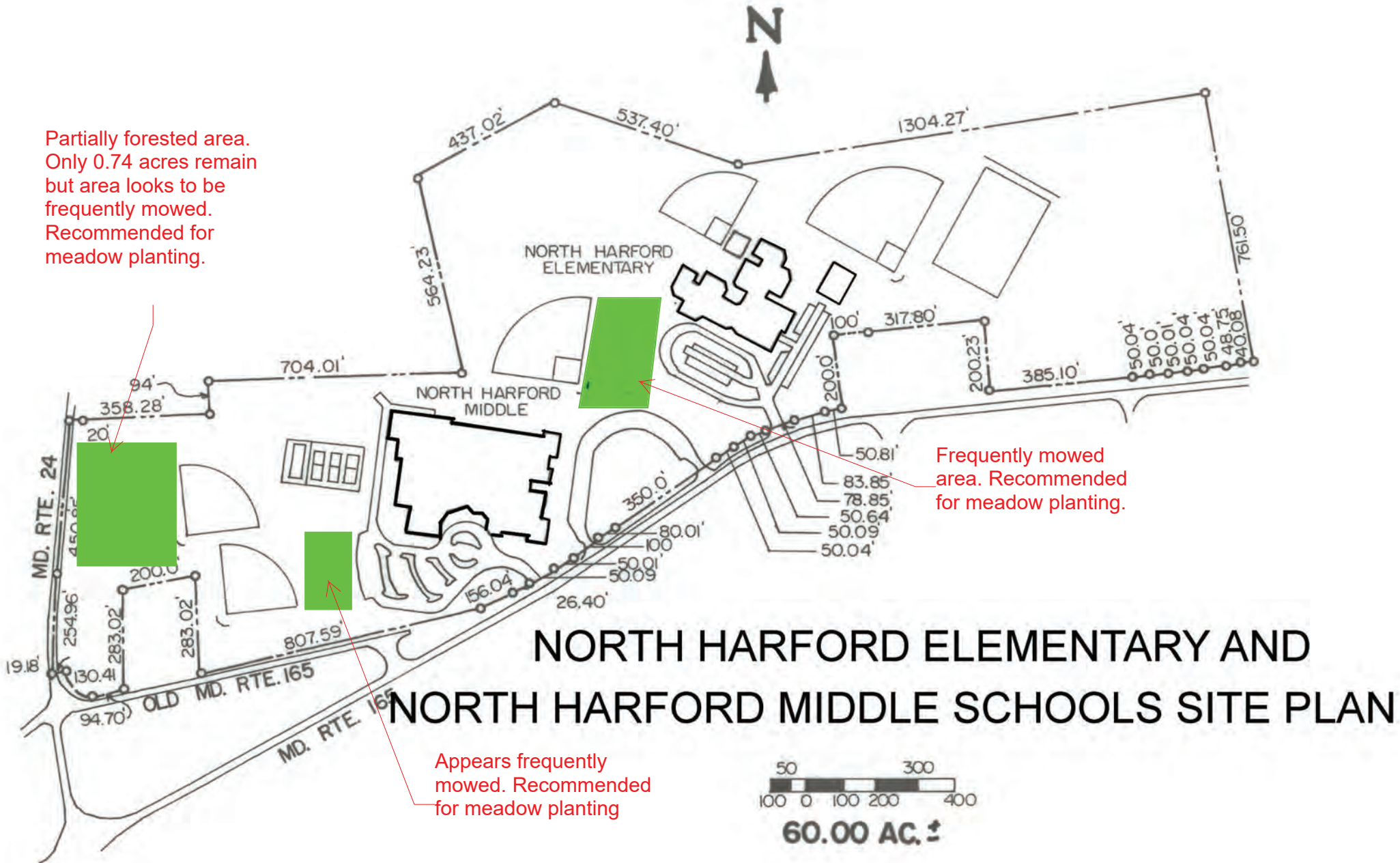
Area looks to be a low mow site, but field verification would be needed.

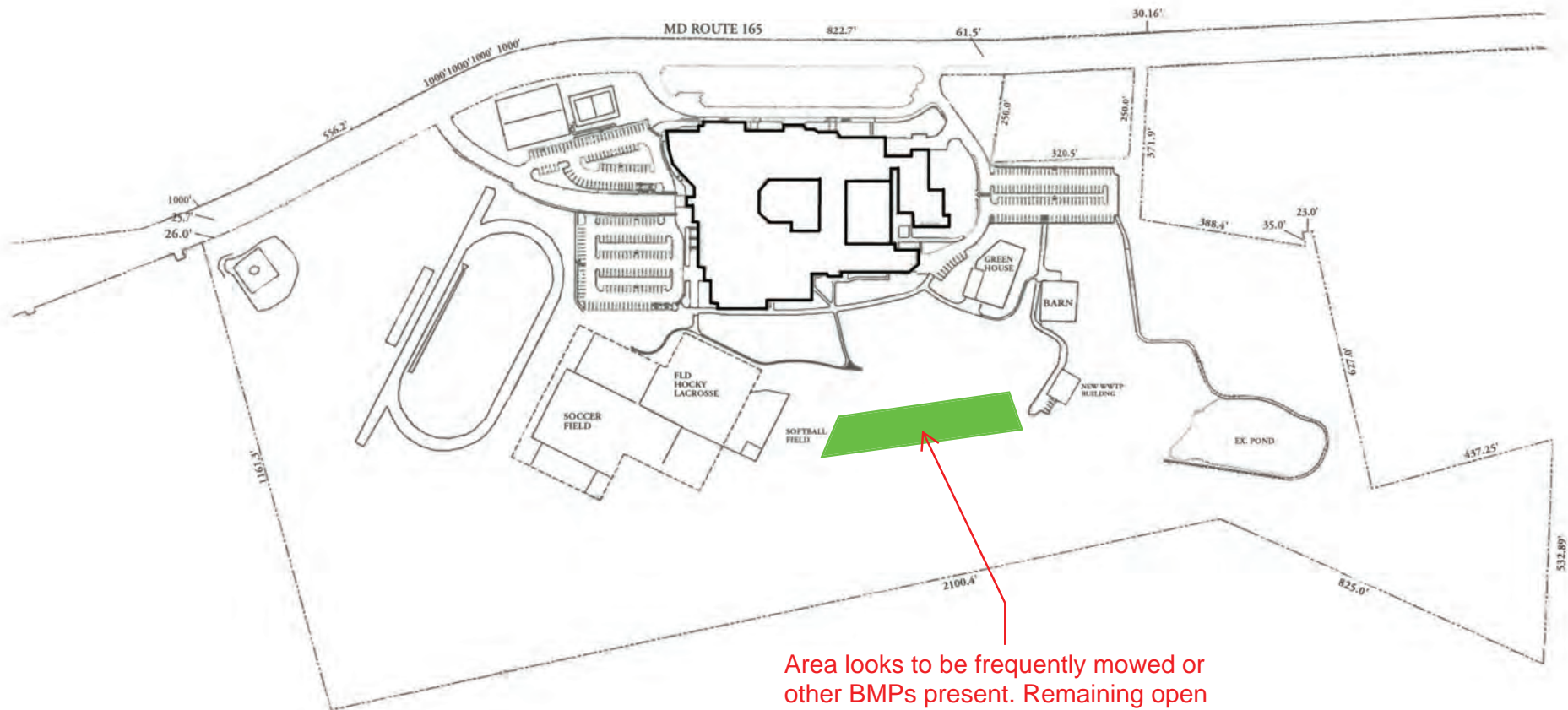
Forested area





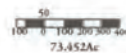
Partially forested area.
Only 0.74 acres remain
but area looks to be
frequently mowed.
Recommended for
meadow planting.

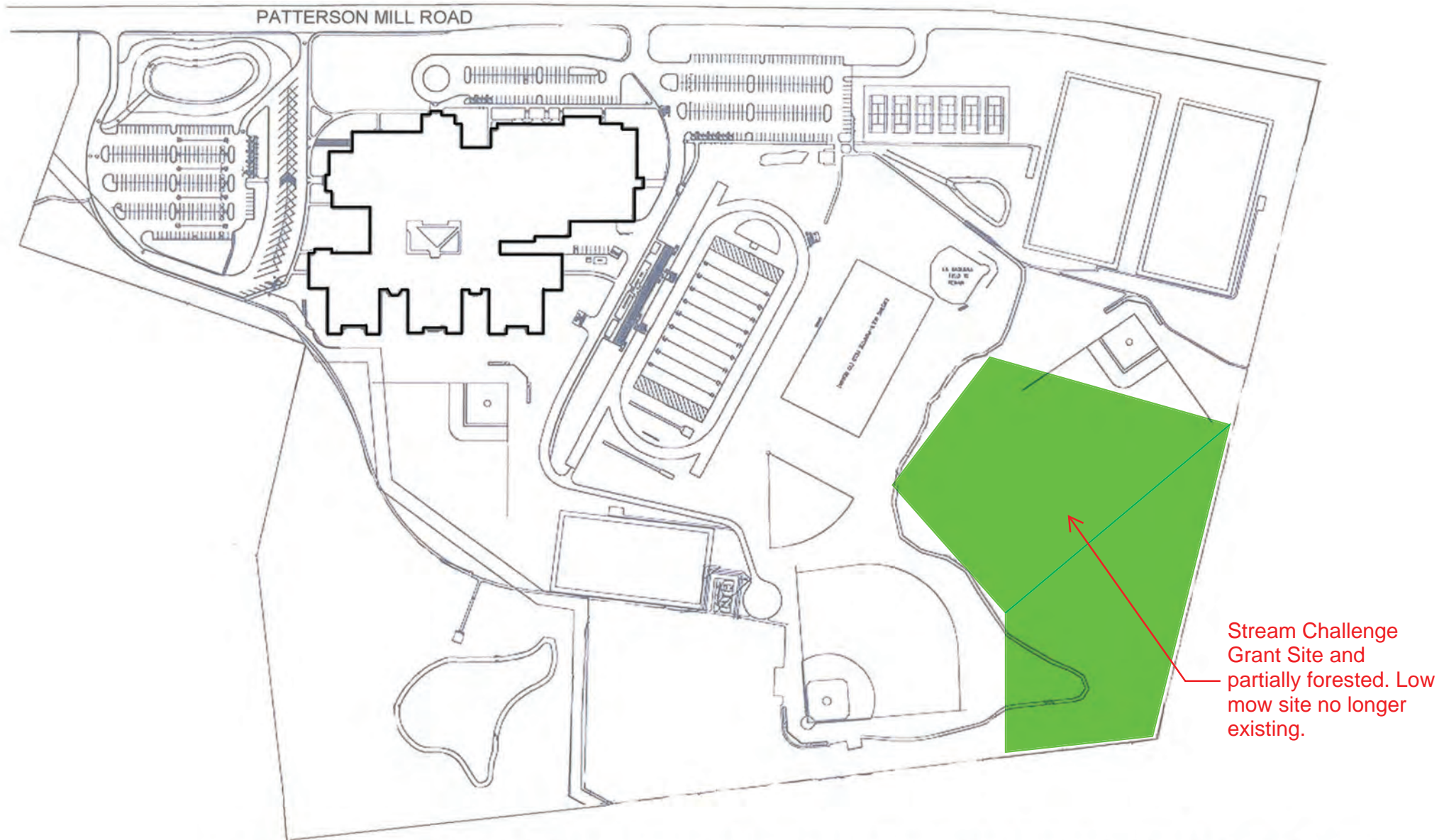




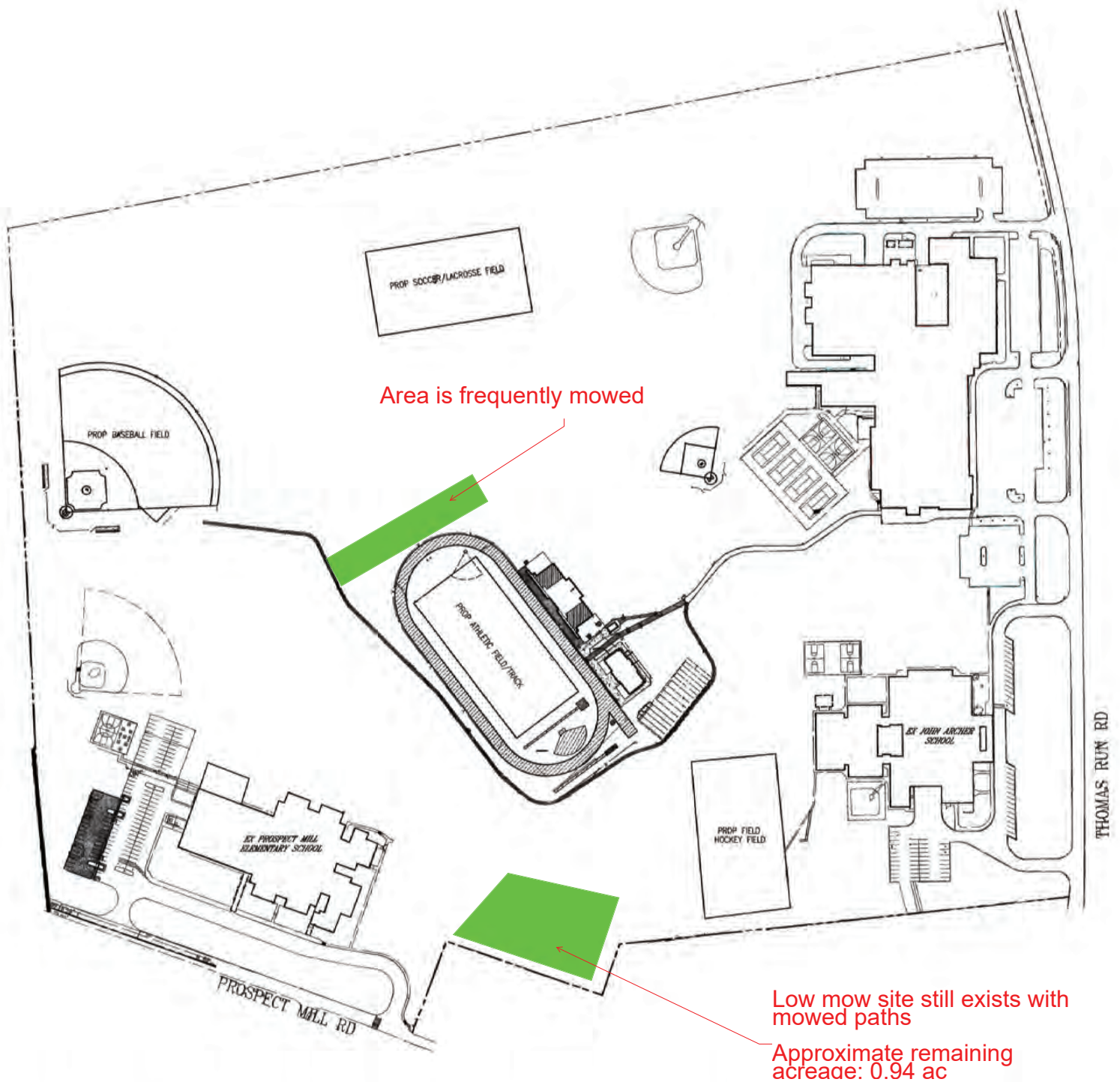
Area looks to be frequently mowed or other BMPs present. Remaining open grassy area (0.25 ac) will be recommended for meadow planting.

NORTH HARFORD HIGH SCHOOL SITE PLAN

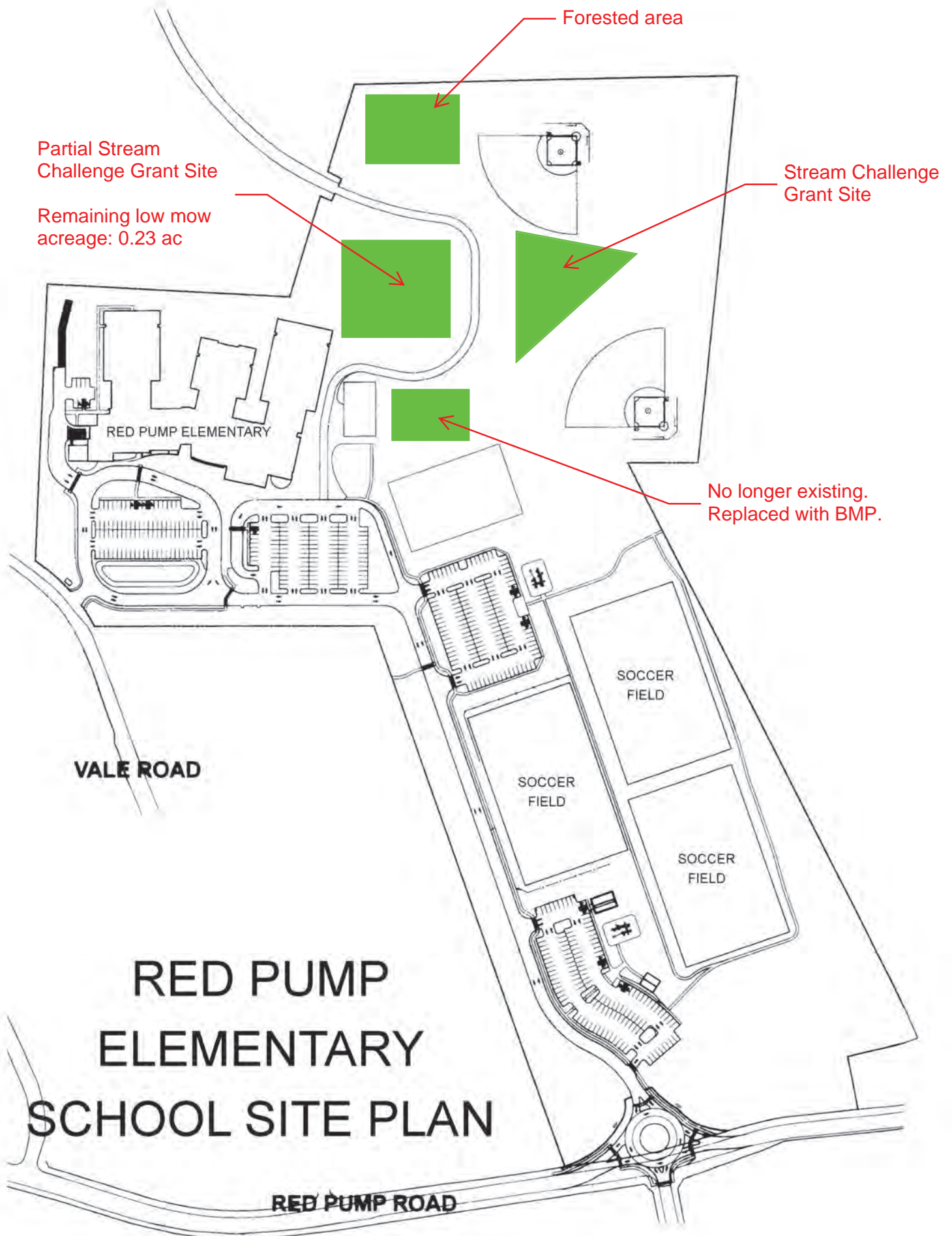


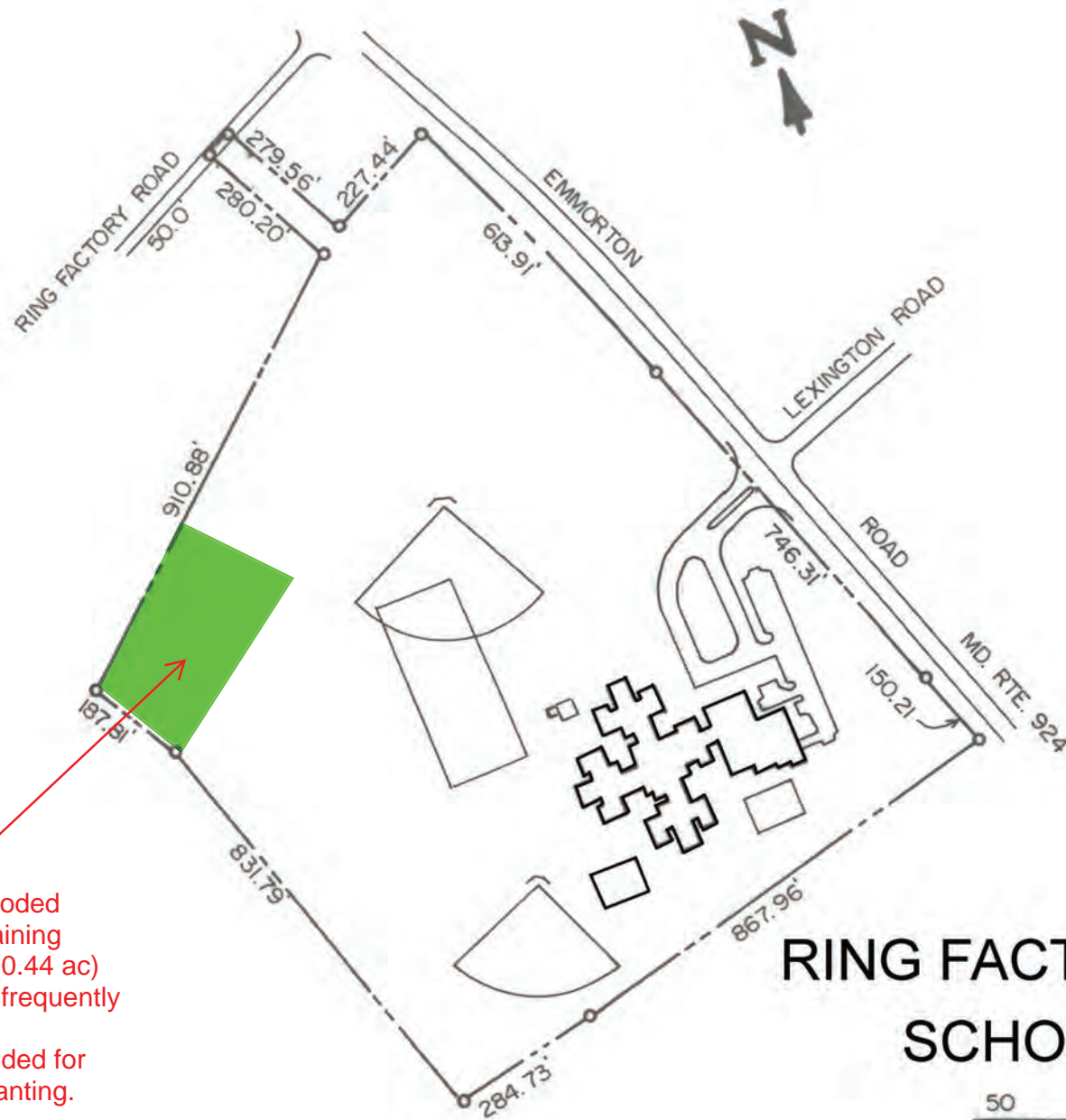


PATTERSON MILL MIDDLE HIGH SCHOOL SITE PLAN

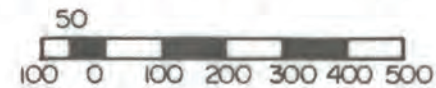


JOHN ARCHER SCHOOL - PROSPECT MILL ELEMENTARY AND HARFORD TECH HIGH SCHOOL SITE PLAN



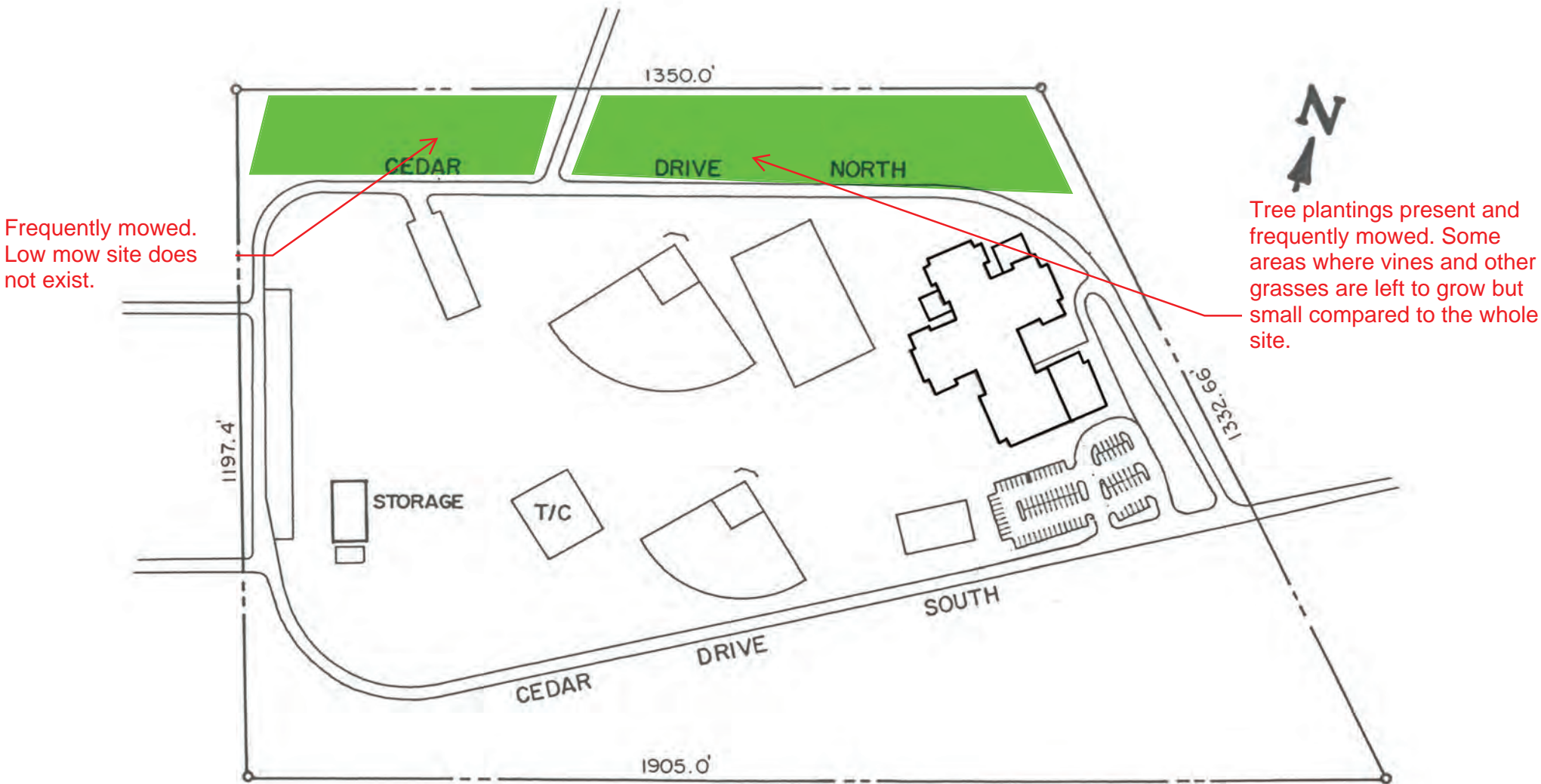


RING FACTORY ELEMENTARY SCHOOL SITE PLAN



34.26 AC. ±

Majority wooded
area. Remaining
open area (0.44 ac)
looks to be frequently
mowed.
Recommended for
meadow planting.



EDGEWOOD ELEMENTARY SCHOOL SITE PLAN



44.71 AC. ±

Attachment E – Existing Alliance for the Chesapeake Bay Sites

Existing Alliance for the Chesapeake Bay Tree Planting Sites

Landowner Name	Location	Acres	Year Planted	BMP Type	BMP Credit/Ac (EIA_f)	Total EIA Credit
Mike Skowron	619 Glenville Road, Churchville, MD	1.5	2019	Forest Planting	1.1	1.65
Henry Harrison	1209 Whitaker Mill Rd Joppa MD 21085	0.5	2019	Urban Tree Canopy	0.38	0.19
St Mark's	2407 Laurel Brook Rd, Fallston, MD 21047	1.5	2019	Forest Planting	1.1	1.65
Barry Stansbury	3874 Peach Orchard Road, Whiteford, MD 21160	1.5	2019	Forest Planting	1.1	1.65
David Kahl	2325 Amoss Mill Road, Pylesville, MD	0.8	2019	Urban Tree Canopy	0.38	0.30
Michael Houser (Chad)	663 Cherry Hill Road, Street, MD	1.9	2019	Forest Planting	1.1	2.09
Barbara Lukasik	4555 Conowingo Road, Darlington, MD	0.6	2019	Urban Tree Canopy	0.38	0.23
Cindy Malloy	1055 Falling Branch Road, Pylesville, MD	1.7	2020	Forest Planting	1.1	1.87
Kirsti Tepper	2320 Edwards lane, Bel Air, MD 21015	1.5	2019	Forest Planting	1.1	1.65
Jerry Preston	4716 Clermont Mill Road, Pylesville, MD 21132	7	2020	Forest Planting	1.1	7.70
Joelle Pouliot	1339 Ryan Road, Fallston MD 21407	0.4	2019	Urban Tree Canopy	0.38	0.15
Greg Edwards	1341 Ryan Road, Fallston MD 21407	0.2	2019	Urban Tree Canopy	0.38	0.08
Cynthia Runyon	3151 Martindale Lane, Forest Hill, MD	0.7	2019	Urban Tree Canopy	0.38	0.27
Frank Schofield	1108 Thompson Way, Street, MD	2.7	2020	Forest Planting	1.1	2.97
David Sedney	610 Old Fallston Road, Fallston MD	1.5	2019	Forest Planting	1.1	1.65
Varnarnsdale, Missy	2410 Island Branch Road, Pylesville, MD 21132	1	2021	Forest Planting	1.1	1.10
Berthenia Crocker	1326 Somerville Road, Bel Air MD 21015	1	2021	Forest Planting	1.1	1.10
Chris Murk	3400 Lord Baltimore Way, Monkton, MD	2	2021	Forest Planting	1.1	2.20
Gary Murk	4062 Madonna Road Jarrettsville, MD	0.5	2021	Urban Tree Canopy	0.38	0.19
Rebecca Murk	4068 Madonna Road, Jarrettsville, MD	1	2021	Forest Planting	1.1	1.10
Eric Smith	3928 Ady Road Pylesville, MD	3	2021	Forest Planting	1.1	3.30
Bruce Kinzinger	338 Quaker Bottom Road, Havre de Grace, MD	3	2021	Forest Planting	1.1	3.30
Anthony Pecoriello	2138 Buell Drive Forest Hill, Fallston, MD	1.5	2021	Forest Planting	1.1	1.65
Total Planting Acres:		37			Total EIA Credit:	38.04